

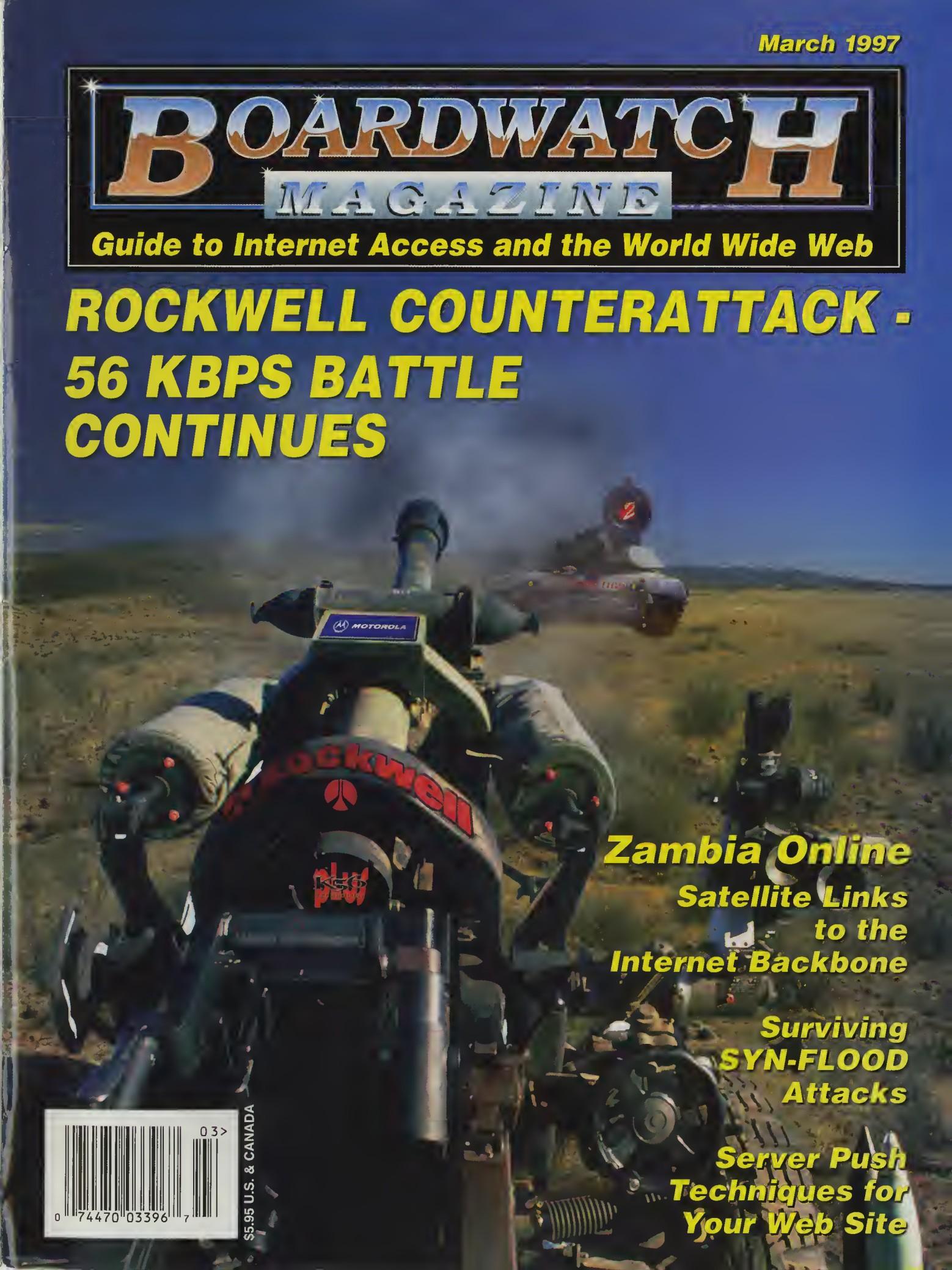
March 1997

# BOARDWATCH

MAGAZINE

**Guide to Internet Access and the World Wide Web**

## **ROCKWELL COUNTERATTACK - 56 KBPS BATTLE CONTINUES**



**Zambia Online**  
**Satellite Links**  
**to the**  
**Internet Backbone**

**Surviving**  
**SYN-FLOOD**  
**Attacks**

**Server Push**  
**Techniques for**  
**Your Web Site**



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Volume 1, Number 3

## Fast 56 Kbps FAQs

There's been a lot of talk – and a lot of confusion – about 56 Kbps technology. Want the plain and simple facts? Here they are.

### 1. Are there any 56 Kbps\*-capable modems shipping today?

Yes. U.S. Robotics has been shipping modems which are upgradable to 56 Kbps\* since August of 1996. Others are promising chipsets in 1997, but make no delivery promises for modems.

### 2. What's the real story on 56 Kbps\* technology upgradability?

Many companies that build modems or incorporate modem technology in their products do so by using modem chipsets from chipset manufacturers. These companies have to wait for the chipset manufacturer to come out with a new modem speed before they can roll it into their products. This means that in order to get 56 Kbps\* technology, new modems must be purchased and complete hardware upgrades must take place in access concentrators and modem pools. U.S. Robotics' approach is different. By basing our modem technology on programmable Digital Signal Processors (DSPs), we don't have to wait for a chipset vendor to come out with the technology.

### 3. Do I have to do "modem surgery" to accommodate the upgrade?

Not if you purchase x2 remote access products from U.S. Robotics. x2 can be installed with a simple software download\*\* – no new hardware installation or testing. Competitors are promising to ship "device sets," which will typically require complete hardware "swap outs" to support 56 Kbps and other technologies.

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x2 Technology eliminates the analog-to-digital conversion in the downstream path of a client-server connection. So x2 can use the maximum amount of the available 64 Kbps bandwidth. (Upstream transmissions continue to flow at V.34 speeds.)

### 5. Has 56 Kbps\* technology been tested over real telephone lines?

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### 6. Why is the service provider end of the equation so important?

Because 56 Kbps\* speed cannot be achieved with analog modem-to-analog modem connections. An ISP or corporate site must connect to the phone company's digital network to deliver the higher speeds to its subscribers. This connection must be via a T1 line or an ISDN PRI or BRI. Additionally, both ends of the connection (modem and ISP) must employ the same 56 Kbps\* technology.

### 7. Where does 56 Kbps technology\* stand with the standards bodies?

It's hard to say when a standard will be announced, but history tells us that the expected time frame is six to 18 months. U.S. Robotics is committed to the standards process and was the first company to work with both the ITU-T (global standards body) and TIA (North American standards body) on standardization of x2/56Kbps\* technology.

#### The numbers do the talking:

The technology that surveyed ISPs plan to use to offer 56 Kbps service:<sup>‡</sup>

Technology	ISPs
U.S. Robotics x2 Technology	76.99%
Rockwell K56Plus	20.8%
Lucent V.Flex2	5.31%

## x2 Xtreme Advantage

Be a part of the revolution – participate in x2 Xtreme Advantage, a special program exclusively for ISPs. x2 Xtreme Advantage offers ISPs the opportunity to reach the millions of Courier, Sportster and Megahertz modem users accessing the Internet every day with x2/56 Kbps\* downloads.

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- opportunities to capitalize on the heavily marketed x2 Technology
- listing of your service on the U.S. Robotics worldwide web site

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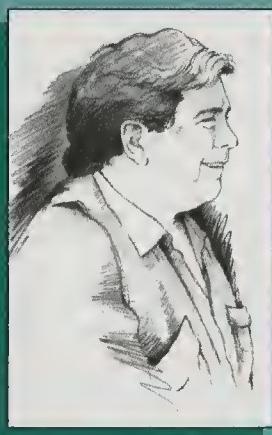
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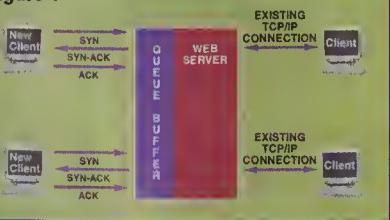
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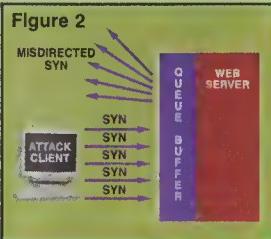
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# EDITOR'S NOTES

by Jack Rickard

## AY.OH.WELL AND THE TELEPHONE SYSTEM

We have a potentially fatal conundrum arising from what may be less than greed but probably more than a gentle view that the grass is always greener in the neighbor's field. Basically, Mr. Case of AOL was mildly chagrined to see some online activity taking place that didn't really involve America Online and decided he wanted to be an Internet service provider too. And all the existing telephone companies in the country seem vaguely miffed and disappointed that they didn't invent the Internet and that others are getting into the communications game without their permission or awe inspiring margins.

In December, Mr. Case, to scratch his vague unease, decided he wanted to be an Internet service provider too. But as many of us know, it pays to do some research before jumping into a "new business" and with an all encompassing hubris of astounding proportions, he failed to observe that maxim. AOL announced flat rate Internet access at \$19.95 in December. Since AT&T and a gazillion smaller Internet service providers had been selling dial-up access at this rate for more than a year, it looked like an appropriate move. I guess at this point I believe it will ultimately be fatal for America Online and unfortunately could drive some profound changes across the entire landscape of telephone services, Internet access, and everything related.

Had Mr. Case the use of a pocket calculator and anyone within forty miles with a clue, he no doubt would have noted that dial-up Internet access with flat billing rates spirals toward a ratio of 10 users per modem port rather quickly. This varies in microclimates of specific geographic niches, but on a broad enough scale a range of 10:1 to 12:1 is about what is going on out there. AT&T

pushes this a bit to about 14.5:1, but note that they can do some pretty nifty things backhauling calls across their voice long distance network to spread POP loads — even to the point of taking advantage of time zone differences.

Across 3,640 Internet service providers, we find the extant ratio to be 9.26:1. This isn't a guess, it's the reported numbers of customers and modem ports. This is actually a bit generous, but reflects a snapshot in time of actual customers to actual ports. The ISPs are adding customers at a 93% annual growth rate, and it takes time to install modems, remote access servers, and more pointedly to get telcos to install copper. So they lead their customer acquisition growth curve by 10-15% or so which roughly corresponds to the six weeks they can often wait for copper. Trust me, none of these thrifty veterans of the small scale install any modems just to bask in the warm glow of the front panel indicator lights. If they are installing these ports, they need these ports.

Mr. Case it would appear went to flat rate service with just under 8 million customers and approximately 260,000 telephone lines. That, according to my very trusty Casio fx-115D Super-FX with binary, octal, hexadecimal, and decimal modes, and actually in all those modes, looks like a ratio of 30.769 customers to each well-lit modem port. So for about two-thirds of AOLians, it's more like AY, OH WELL — no AOL after 4:00 PM.

This may look like a variation on Yogi Berra's famous "Nobody goes there anymore — it's too crowded." What a problem to have — more customers than you can feed. But bear with me, because this goes bad for AOL rather quickly.

Mr. Case avows that they will spend **\$500 million** to upgrade the network and dial-up capacity of the service and that he intends to bring that ratio down to 20:1.

There are still a couple of signs of deep cluelessness here. First 20:1 isn't the answer. In fact, we have some rather bad news for Mr. Case based on the somewhat gruesome experiences of a few ISPs who have gone over the 14:1 precipice and learned this one the hard way.

Dial-up users are more or less happy to use the Internet as it strikes them as long as it is available when and where they need it. Typically, there are user-configurable inactivity timeout settings in Windows95 that, if you are not using the service for 10 minutes or 15 minutes, will simply log you out. It is easy enough to click an icon and get back on to do some more e-mail or web browsing as the mood strikes.

But in the event of a busy signal, this happy state of affairs changes. You click the icon again. If you get through on the second click, well, these computers are a trifle glitchy anyway now aren't they? But if you DON'T get through on the second click, the situation gains a sort of nasty, irritable attention.

The result of a few of these experiences is a significant modification of human behavior. If they DO get through, they now HAVE a line that has changed from an item of plenty taken for granted to a resource to HAVE. And so they stay online. They disable the inactivity timer, and simply leave the line up IN CASE they might want to send an e-mail message later in the evening. It is, after all, flat rate is it not? That's what they advertised.

The smaller ISPs have battled this by installing inactivity timers on THEIR end. If no traffic passes a port for a specific period of time, the server disconnects the port. Users have responded with trivial programs that simply squirt a bit of data every few minutes to foil these. And the battle is on.

What I am describing is what most veteran ISPs refer to as "line hoarding" and

it is a very real response to busy signals. This causes a kind of threshold/cascade element to the problem. And once you go over the precipice here, it is a gruesome climb back. One ISP went to a FIVE TO ONE ratio and sent out pitiful pleading messages to all users that there were plenty of lines available now, please stop holding lines, and if you don't I'll have to shut down the whole service. He sent these messages for days. Finally, they tried reverting to their previous patterns, found he had indeed installed sufficient modems, and the problems eased. He now has more modems than he can use in a year of course. But the emergency has passed.

To get to a 10:1 ratio, assuming that would help at this stage, Mr. Case needs to deploy 540,000 modem ports. That's **\$350 million** just for the ports, without any installation, new copper, etc. To actually do all this probably gets very close to a billion dollar investment. But it doesn't matter. Nobody HAS 540,000 modem ports to sell him. He can order them. They will happily take the order, but none of the modem manufacturers has that kind of excess capacity. Ascend makes an impressive device titled the MAX TNT that will do 672 ports per shelf and potentially 4,032 in a single rack. But UUNET just ordered 150 of these **\$450,000** devices, and are receiving MAX 4004 devices in massive stacks in their place while Ascend scrambles to fill such an order. They would be happy to help Mr. Case, probably sometime in mid-1998.

US Robotics is actually the vendor of choice in this instance. But essentially the same story. Nobody can overnight you a box of 540,000 modem ports.

If they could, it is a massive undertaking to deploy and install them all in hundreds of POP locations around the country. And that assumes that the old U.S. West truck is already patiently waiting for you on your arrival to proudly plunk down all that new copper. Rub a lamp there, cowboy.

AOL meanwhile is encountering some conflicting signals. There is no real indicator of how many people are getting busy signals. But there is also the HOTEL FIRE FACTOR. While nobody likes to get burned, if the hotel is on fire, everyone wants to go watch. I myself just found it irresistible to go logon to AOL just to watch the place burn, in spite of the fact that I hadn't been on the service for over a year previously. Tell the truth. YOU DID TOO, DIDN'T YOU?

The situation has been all over the news media with hundreds of stories about the shortage of lines at AOL. The natural human response is to go get an account and find out what they have on there that we've all been missing — that is causing such a feeding frenzy. I don't want to be left out if it's something good, like free beer online, do you?

The result of course will be an incredible windfall for the rank and file ISPs, other services such as CompuServe and AT&T, etc. as AOLians scramble for the higher ground. See my previous editorials on Tsunami waves on the Internet. But I think many ISPs will enjoy unexpectedly high sign-up rates throughout 1997 as a fallout of the AOL situation.

AOL will be running a revolving door of newbies looking for the source of smoke, and disgusted veterans leaving for greener pastures, that will mask the problem for them until late in the year or perhaps early 1998. At that point, they may have their 800,000 modems in place, and nobody will care. The plunge curve on the back end of this graph will be utterly gruesome and I would expect that following on the massive investment in dial-up ports, it will kill the company. The only way to avoid it is to back off the flat rate offer, but I think a combination of Mr. Case's astounding hubris, and the ire of millions of AOLians already thoroughly hosed down by the billing practices of this company will prevent that move.

So I think the AOL move was a fatal and irrecoverable error. I don't think they can conceivably recover from it using any strategy that comes to mind. But there are even wider implications.

You see the RBOC, think THEY want to be ISPs. Actually they rather desperately don't, but they simply lack the intellectual capacity to grasp this fact and so they THINK they want to be ISPs. It drives them to distraction that all this media attention and activity is going on without their direct participation/manipulation. Some have begun offering services and after six months or a year amassed as many as 100,000 customers using their dial-up access service at **\$20 per month**. That's a cool **\$2 million** per month and unbelievable customer support problems — about enough money in the door to fund executive level meetings about it but no more, as they grapple with a new kind of communications model they ill understand and won't like once they do understand it.

So their ploy is to whine to the FCC, the courts, and the Congress that all of this shouldn't be happening, is ultimately threatening the very existence of voice telephone calls as we know them, and some law or regulation should be passed to make this all go away.



The most current threat is an FCC docket complete with hearings modifying the current access charge structure. Access charges were initiated in the 1984 breakup of the Bell System requiring long distance carriers to pay per minute access charges to both the originating local telco and the destination local telco for each long distance call. It was set nominally at about 3.5 cents per minute on both ends.

Since 1984, the LD business has changed a lot as well. Today, 10 cent per minute charges are comprised of about 3.5 cents access charge to one RBOC, 3.5 cents access charge to another RBOC, and about 3 cents to cover the billing/accounting process. This is precisely why I've been saying since 1988 that flat rate long distance voice was coming. The LDs only make a penny a minute now. To gain market share, if the access charges were gone, it would take about fifteen minutes before one of them offered national LD for **\$75 per month**. Where THAT price war winds up is simply anybody's guess.

The entire body of sentiment at the FCC, chartered by the Telecommunications Act of 1996, is to do away with access charges entirely. But in the interim, the telcos have appealed to Federal Courts who have essentially halted the progress toward competition in the local loop.

Data has a unique role in all of this. At divestiture, a very specific 24-month exemption was granted for value added data services — at that time things like CompuServe, GEnie, MCIMail, etc. The FCC opened a proposed rulemaking in 1986 to expire this exemption, as scheduled by law, on the first day of 1987. Bill Louden of GEnie wrote up a slightly distorted but effective missive about the "modem tax" that caused thousands of online aficionados to protest vaguely to

the FCC. So bowing to public pressure, they dropped the entire thing.

Currently, the telcos are attempting to amend the access charges to again expire this exemption and have Internet service providers pay this access charge. We did a bit on this in our February issue, and it would appear the FCC has received over 100,000 e-mail messages on the issue. Again, we can find no sign of any sentiment within the FCC itself to support this.

But the message the telcos are bringing is based on a Bell Atlantic study done last year indicating that the local central office switches were burdened by the increased traffic caused by dial-up Internet access. This study was so seriously and obviously flawed, and so comically self serving, I didn't think anyone would take it seriously and didn't bother to waste a column inch responding to it. That may have been a mistake. It has actually gained ground with all the RBOCs quoting it in an incessant chant despite the fact that it totally ignores both the incredible revenues the RBOCs gleaned from literally millions of second line installations at the CALLER end specifically for data activities, and the fact that the longer data calls are both statistically minuscule against the number of voice calls and completely avoid peak calling periods for voice. The voice peak that the system must be designed for occurs at 10:00-11:00 AM. Dial-up Internet use, and in fact all online data use forever historically has been at 8:00 to 10:00 PM.

But along comes Steve Case blundering about trying to be an Internet service provider. In Washington state, this really did cause some serious problems with the voice telephone network. First, the line hoarding went on all day, including during peak voice periods. Second, incompletely completed calls that result in busy signals DO burden the system.

In this issue, I am going to do something fairly unusual and share my editorial space. And I'm going to do it not with a close friend and ally, but with Scott McClellan, Vice President of U.S. West in Seattle. In this January 31 letter, Mr. McClellan responds rather artfully to a January 24 letter from the Washington Utilities and Transportation Commission taking them to task for a large number of incompletely completed voice calls in Seattle in December and January. This was not a private communication, but a letter on public record with the WUTC.

We think **Boardwatch** readers will find this position interesting and informative.

I feel pretty strongly that Mr. McClellan has missed the mark on the true load on his system — whether innocently or by design I cannot determine. It isn't the ISP concentration, the number of data calls, or the duration of those calls posing a problem at this point. Understand that calls to busy circuits STILL LOAD THE SYSTEM. And I'm pretty certain the level of call increase he is reporting is primarily, if not nearly totally, reflective of busy signal calls that were never answered — not normal ISP traffic that contained long data calls. And it almost totally corresponds to the AOL situation on the timeline.

But ultimately, in the future, we do have a problem. We all think we have a telephone line all the time. In fact, it is an intermittent system. The inherent nature of packet networks is that they are connectionless. Ideally, you would have a standing "circuit" that lets you squirt packets on demand. This is actually inherently MUCH more efficient than "setting up" a call each time access point to point is desired — which is how the voice system works. But as these two very different communications scenarios clash, there are some real problems in the interim.

The apparent solution is to ration the "valuable resource" with metered rates. The true solution is to use bare copper, which everyone DOES have all the time, directly between ISPs and end customers and any of the variety of xDSL type modems that are becoming available. We are going to devote considerable coverage of xDSL in future issues of **Boardwatch** all this year. But it effectively wires around the switch at the telco, and eliminates the problem. We're basically setting up a parallel copper network here, and one that can deliver data at rates up to 2 Mbps potentially, with no actual connection to the voice network at all.

If Mr. McClellan's position is pure, you will see U.S. West rush to aid this move with very inexpensive and available dry copper pairs to the industry, at prices analogous to the same dry copper pairs we have seen them sell to the home and industrial alarm industry for decades. Having dealt this week with U.S. West on just this topic, I happen to know they are already fighting it tooth and nail and desperately want you to buy THEIR new \$175 per month xDSL service and will

do anything, including blatantly lie into the telephone, about the availability and existing tariffs for dry pairs/alarm circuits/signal circuits/banana circuits et al. But IF Mr. McClellan's points in the accompanying letter have ANY validity, I'm sure they will reverse this position, and work day and night to assist the Internet service providers throughout their fourteen state territory to deploy xDSL on inexpensive **\$16 monthly** copper pairs (the tariff price here in Colorado actually), and so move this egregious problem threatening our very lives and way of life vis a vis the voice network, off the local CO switches.

But finally, I'm also seeing some sentiment among service providers everywhere to back away from unlimited flat rate access. Many are deploying hour limits. But we may see a number of them take another look at metered access, at least for the analog dial-up segment of Internet access.

**Jack Rickard**  
**Editor Rotundus**



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**Transportation Commission**  
1300 S. Evergreen Park Dr. SW  
Olympia, Washington 98504-7250

**Re: January 24, 1997**  
**Letter to Scott McClellan**

Dear Chairman Nelson:

*This is in response to your letter of January 24, 1997, in which you describe, and ask for resolution of, problems related to customers' ability to complete calls to the Seattle Main D54 central office switch. U S WEST does not agree with the conclusions of the staff investigation cited in your letter; however U S WEST has not yet had an opportunity to review the investigation in detail with the Commission Staff. A meeting has been*

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scheduled to review detailed interoffice traffic data with staff On February 10, 1997.

I have to say I am disturbed by the way this matter has been handled. When the Commission became aware of this problem, it did not call me to ask about the source of the problem and to work on a solution. Instead, it fired off a letter to me, essentially accusing U S WEST of mismanagement and threatening substantial fines. I was given until today to respond to that letter.

However, on Wednesday, before I had an opportunity to respond, the Commission's letter was leaked to the media, which resulted in long, negative, front-page stories in Washington's major newspaper. That approach to doing business is, to say the least, not conducive to rational, productive problem solving.

Following are the facts as U S WEST knows them at this point, including the magnitude of the problem and the likely cause. I also plan to address the suggestion that U S WEST has violated a Commission rule; I do not believe this to be the case. Finally, I will address policy issues raised by this situation.

## FACTS

On December 24, 1996, U S WEST sent a letter to the Commission that contained traffic data and recent engineering job history for specific interoffice routes. The letter explained procedures used by U S WEST to ensure appropriate interoffice trunking levels and included detailed confidential reports from our trunk servicing system. These reports are used by U S WEST to forecast future trunking requirements based on predicted call busy hour and blockage information. They generally provide for an engineering design that exceeds actual call volume requirements.

The milestone report attached to our December letter provided a summary of upgraded interoffice trunking activity due to increased call volumes based on actual traffic data.

Attached is an actual depiction of traffic usage, call attempts, and percent blockage data for the trunk group between the Seattle tandem 355T and Seattle Main DS4 switch for one week per month from September, 1996 to January, 1997. The report depicts dramatic increases in the usage and call attempts during this

time. The number of calls attempted over this trunk group for the week of January 5, 1997 was over 650,000 compared to 340,117 in September. The number of calls nearly doubled in just four months. The report also indicates that usage steadily increased and is spread over many hours as opposed to being concentrated in a single busy hour. The busy hour for this trunk group historically was 10:00 to 11:00 AM. Now the trunk group has steady high usage from 10:00 AM to midnight, with the highest usage being from 3:00 to 4:00 PM. The average usage per trunk nearly doubled from November to January. Detailed traffic reports are too voluminous to include with this report; the specific reports will be shared with the Commission staff at the February 10, 1997 meeting.

## STATEMENT OF THE PROBLEM

U S WEST assigned a task force to investigate these dramatically increased call volumes and fundamentally new call characteristics. Part of this work focused on making a determination about what the specific changes were and why they were occurring. U S WEST determined that a great deal of traffic which ordinarily flows into Seattle Main on direct trunks was overflowing onto the tandem. U S WEST determined that a large number of calls were of much longer duration than expected for voice calls. Many of the calls had hold times of more than two hours and were made primarily to lines with modems. Thus, it is our preliminary determination that much of the changed traffic is data or Internet related.

Reinforcing this determination is the fact that during December, 1996, AOL began a very public offering of flat rated unlimited Internet access. The avalanche of traffic on the network increased by 60% in just two weeks.

Although U S WEST has taken extraordinary steps, including increasing the number of high-capacity trunk lines between its Seattle and Bellevue offices from 96 to 240, it hasn't been enough. Interoffice trunk blocking cannot be resolved by simply adding additional network capacity.

In an October 1996 letter, U S WEST advised the Commission that Internet calls generally last forty to sixty minutes while traditional calls last six minutes. If consumers can access an Internet provider and do not pay for that access on a usage basis, there is no incentive to terminate the call even if the subscriber

is no longer using the service. Because consumers have had difficulty getting through to their Internet provider, they frequently will leave the connection up indefinitely.

U S WEST has identified approximately 15 Internet providers (IPs) served by the Seattle Main DS4 switch. We have also identified several ISP being served out of the alternative local exchange company (ALECs) offices. The traffic stimulated by these Internet providers is very different both in quantities and duration than traditional voice traffic for which the public network has been engineered. On average, local customers' usage is 3.5 hundred call seconds (CCS) or less than six minutes, during the busiest hour of the day. The ISP traffic is much higher, with many of the users stimulating 36 CCS per hour for hours at a time (the equivalent of being on the line an entire hour). In fact, connections have been identified that were established on Monday morning and remain up until Friday afternoon.

U S WEST's local network is designed and managed to long-standing traffic engineering standards. These standards are based on statistical models that predict the probability that calls will be delivered at prescribed blocking levels, given specific traffic characteristics. Local networks are designed with the objective of blocking less than one percent of calls during the busiest hour during the busiest period of the year. To meet these blocking objectives, a variety of trunking configurations are applied in local networks. In large metropolitan networks, like Seattle, traffic is completed over circuits directly between end offices and through tandem or transit offices that connect multiple local offices.

Trunks between a specific end office and a tandem are common trunks and shared by all traffic connected through the tandem. When callers from all over the Seattle area are trying to reach ISPs served in a single switch, and the ISP cannot answer all of the calls, the direct trunks between end offices begin to fill up, causing traffic to be rerouted through the tandem. If the calls are still not answered, the tandem quickly reaches capacity. When this occurs, the calling customer receives a no circuit announcement (all circuits busy) or tone.

Calls to Internet providers have introduced additional traffic management complexity. Many Internet providers have significantly more customers than

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access connections. When all of their access connections are in use, ISPs' customers continue to generate multiple, unsuccessful attempts. Because these attempts are generated by computers, unsuccessful call attempts may be generated until a connection is established. These multiple attempts create congestion in the local network, that block both ISP and traditional voice traffic.

Further worsening the congestion at the tandem is the fact that some ALECs are delivering all of their traffic to the tandem. The combination of the ALEC traffic and the IP, traffic stretches the engineered capacity of the tandem switch.

Some ALECs are connecting directly to the end office, which helps alleviate some of the pressure. U S WEST is working with these providers to re-configure their networks; U S WEST is also reassigning its operator services traffic to other switches.

Another factor in the blocking is the storm conditions that Washington recently experienced. The network is typically overloaded during such storms due to extraordinary "off-hook" conditions. Our analysis clearly indicates that many blockages that occurred in November and December were storm related.

#### **STEPS U S WEST HAS TAKEN**

As previously reviewed with this Commission, there are two processes by which we decide when to add trunks. Planned servicing is a monthly activity designed to bring trunk groups up to forecasted quantities based on historical data. Demand servicing occurs when, during continual monitoring of trunk groups, unforeseen demand appears and immediate action is required.

U S WEST has continued to add capacity to the tandem trunk group and to selected direct trunk groups. An additional 144 will be augmented to this trunk group by February 7, 1297. Direct trunk groups have been augmented among and between other offices in the Seattle area to decrease the total traffic presented to the tandem switch.

An additional 144 trunks will be added when an equipment addition is completed in March. This added capacity constitutes an increase of 127% over 17 months on this trunk group alone. This increase in trunks will have increased the call

handling capacity of the trunk group by 136%. Prior period growth has been steady at approximately 12% per year or 1% a month.

U S WEST continually monitors the load balance in our switches to ensure all IP lines are not in the same part of the switch and the load is distributed over the whole switch. U S WEST also continually monitors trunking data and adds capacity where needed. However, because of the sudden growth, we have exhausted the capacity of trunk ports and additional equipment typically requires twenty-six weeks to engineer, install and certify for service.

U S WEST is also looking at several long term solutions which include:

Working with Bellcore to define and develop intelligent network routing solutions to better manage calling patterns.

Working with our vendors to develop call routing and control switching system software. These developments will enable capabilities to minimize the impact of calls that cannot be completed due to lack of adequate ISP facilities.

Evaluating alternative architectures and topologies to better handle IP traffic. These alternatives include creation of high capacity circuit or statistically switched networks. Implementation of these alternatives would, of course, require participation and cooperation of the industry, including ISPs.

Another solution, not within U S WEST's control, requires that the ISP have enough lines to complete the calls stimulated by their own advertising.

U S WEST has set up subscriber line usage studies to help determine how many lines they need. (This only covers the IPs on our own network and would not include those on the ALEC switches.) Network management controls have been invoked on U S WEST IP subscriber numbers resulting in the reduction of severe blocking during peak times to avoid impact on other callers.

#### **COMMISSION RULES**

The complaints that the Commission has received, and the customer concerns expressed by those complaints, are of major concern to U S WEST. U S WEST is also concerned that the appropriate

legal and engineering standards be applied to determine whether a rule violation has indeed occurred. U S WEST has analyzed the provisions of WAC 480-120-515 and in our view the rule does not apply to the blocking problems which have generated the customer complaints.

The rule, by its express terms, sets forth standards for service quality measurements which are the minimum acceptable quality of service under normal operating conditions. The rule explicitly does not apply to service which is to be achieved during periods of emergency or under extraordinary or abnormal conditions of operation such as those resulting from disruptions of service caused by persons or entities other than the local exchange company.

The Commission, in its January 24 letter, has stated that blocking at the tandem may not exceed 0.5% and has suggested that this design standard is applicable to the blocking problems which have recently been experienced. However, the referenced section of the rule, WAC 480-120-515(2)(b) sets forth a design standard of B.005 for intertoll and intertandem facilities. Intertoll and intertandem facilities are associated with toll traffic, and that design standard therefore applies only to toll traffic. The relevant standard for this situation is contained in WAC 480-120-515(2)(a), which applies to interoffice facilities and which sets forth a design standard of B.O1 level of service. The calls and the blocking which are the subject of this discussion are on interoffice trunk facilities, and the 1% standard is applicable.

Recognizing that the Commission may differ with U S WEST's interpretation, U S WEST submits that the rule is at best ambiguous. Furthermore, the rule was promulgated at a time when the Commission held local exchange service to be a monopoly. Thus, whatever the rule may have meant in 1993, it clearly did not apply to the situation a LEC would face when required to interconnect with and accept traffic from multiple other LECs at the tandem, such as is the case today. Further, ISP traffic was virtually non-existent at that time compared to today's levels.

Finally on this issue, even if the 0.5% were applicable to the local tandem, it is U S WEST's position that the standard would not apply to the blocking occurrences described in the Commission's letter. As noted above, some of the days



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where the standard was exceeded were blizzard or winter storm days, which would come under the force majeure or catastrophe exceptions in the rule.

The call blocking which is due to unlimited, flat-rated Internet promotions such as offered by AT&T or America Online (AOL) also falls squarely within the exceptions contemplated by the rule — the unlimited access to the Internet has resulted in extraordinary and abnormal conditions of operation. These conditions have never been faced before by any provider, and they fall far outside the scope of normal telephone usage. Call durations are, on average, more than ten times what the network is engineered for. While this new information will need to be taken into consideration for the future, it has not been known until now. A local exchange carrier is not required to achieve the design standards under these circumstances, which are clearly not normal operating conditions. The design standards also do not apply if the disruption of service is caused by persons or entities other than the local exchange company. These flat-rated Internet promotions are wholly outside the control of U S WEST and to the extent that the unlimited access has disrupted service, the cause is clearly persons or entities other than U S WEST.

## POLICY ISSUES

The solution to this problem is to first acknowledge that the rate structure in Washington does not incent efficient use of the telecommunications network. It is also important to understand that the problem associated with interoffice trunk blocking cannot be resolved by simply adding additional network capacity. The main source of the problem is the improper rate structure that exists in Washington. As long as retail and wholesale consumers receive unlimited local service for a flat rate, there is no incentive to utilize their telecommunications service in an efficient manner and interoffice trunk blockage will continue. This is not meant to imply that U S WEST is advocating a blanket repeal of the current ban on measured service. There are likely several pricing structures that would enable people to use the network vigorously while not allowing the waste of this valuable resource.

In Washington Internet subscribers have no incentive to disconnect their connection to their Internet provider when they are no longer using the service; the effect on the local network has been stag-

gering. With unlimited usage at a low flat rate, there is no reason for them to take down the call. In fact, because of the difficulty in getting on line, there is more reason for users to leave the connection up. U S WEST can continue to add as many trunks as possible and it still will not solve the problem. The network was not designed for calls that last five days. Subscribers who use the network in this interoffice not only tie up their serving central office switch, but they also tie up interoffice facilities and tandem switches indefinitely, as well as the ISP's serving central office switch.

Telecom regulations designed for the monopoly era, when "telecom service" meant nothing more than a simple voice call, no longer work in the new environment. Today, many companies provide local service and "telecom" encompasses a host of voice, data and video services, all delivered over the same lines as the old-fashioned telephone call. Unless this outdated, monopoly-era regulatory thinking is changed to work in this new world, Washington's statewide local telecom networks will receive too little investment, too much use and the result will be digital gridlock that will make the current situation seem minor.

The inefficient use of the network by Internet users is further complicated by the new area of multiple telecommunications providers. When IP's change their telecommunications provider, a massive shift occurs in the traffic patterns. Interoffice facilities, the local tandem switch and overflow trunk routes are no longer adequate, virtually overnight. U S WEST may correct the problem for an IP, but if the IP changes providers, they may completely change their traffic pattern and create new blocking problems. ALECs who do not coordinate this massive change with U S WEST create added burdens on the network.

Couple this phenomenon with the Commission's recent arbitration rulings that provide for all traffic to route through the local tandem and further network inefficiencies are incented. New investment is also not incented when U S WEST is required to make all of its network facilities and services available to new local competitors at prices that do not cover the cost of the new investment. Rather than threaten U S WEST with substantial fines and accusations of mis-management, the commission should attempt to better understand the current demand on the telecommunications infrastructure and

the challenges now before all telecommunications companies.

The Commission needs to examine its pricing policies in light of these new issues and work with the industry to develop solutions, not to exacerbate the problem. More appropriate solutions could be obtained through industry forums facilitated by the Commission that address long term industry solutions. Re-examination of outdated regulatory policies would also be most productive. Areas that require industry attention include improved forecasting by all local service providers, improved coordination of significant traffic changes, improved compensation arrangements, implementation of standardized industry network controls, and new investment incentives.

It is simply inappropriate to consider this as a U S WEST problem when industry journals indicate this is a nationwide problem. Furthermore, it is uncertain how long this Internet traffic will remain on U S WEST's network.

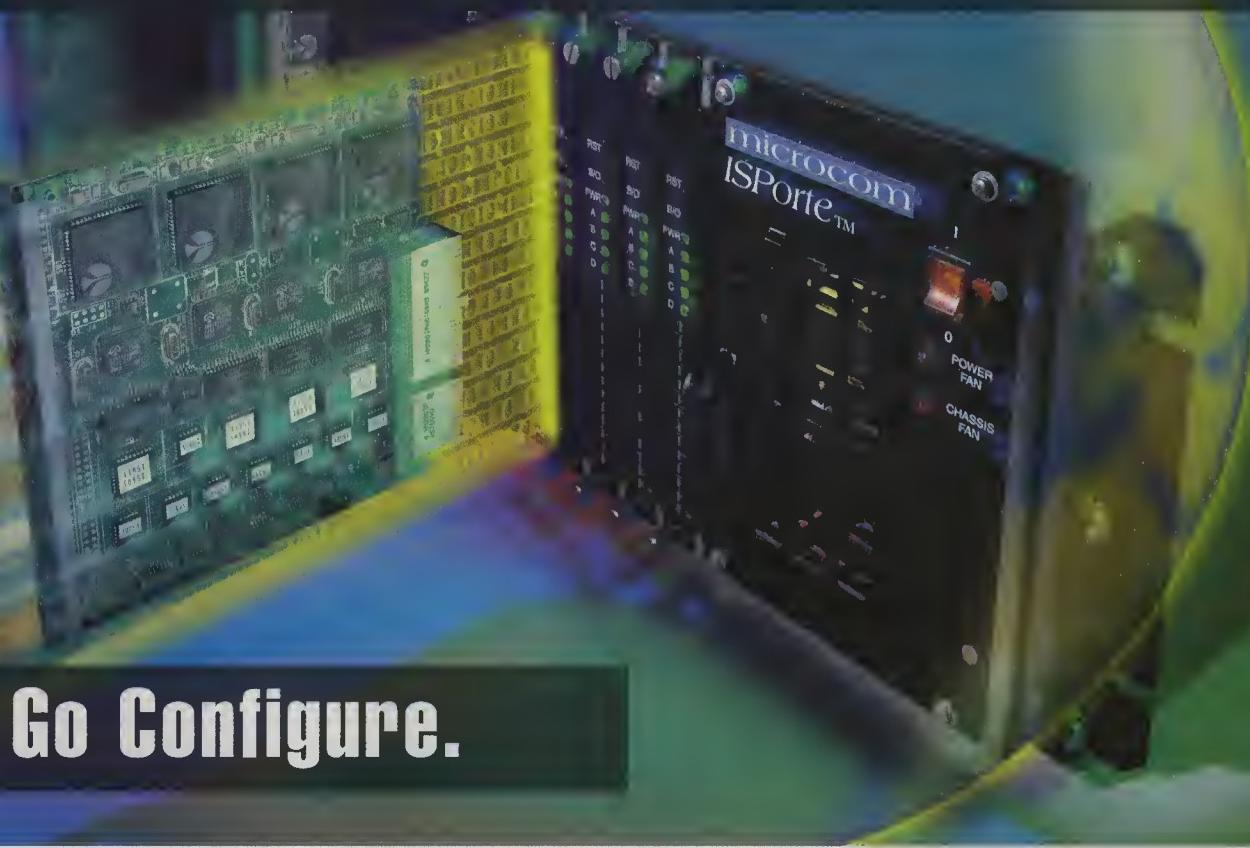
Recent press releases and ad campaigns indicate that IPs and/or associated companies intend to build their own infrastructure and eventually bypass the "telephone network". (See the attached article.) If U S WEST continues to build to handle excessive traffic, our ratepayers will be left with the cost of stranded capacity when ISPs and ALECs build their own facilities. This is clearly not responsible public policy.

I look forward to future discussions with you and your staff to productively address this problem along with other industry participants. If you have any questions please call me at **206-345-2002**.

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## Letters to the Editor

Boardwatch Magazine  
8500 W Bowles Ave Suite 210  
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# LETTERS TO THE EDITOR

Address correspondence to Letters to the Editor, *Boardwatch Magazine*, 8500 West Bowles Ave., Suite 210, Littleton, CO 80123; by fax to (303)933-2939 or by e-mail to [letters@boardwatch.com](mailto:letters@boardwatch.com)

### WHERE'S THE BABB?

Hi Jack,

First off, I want to thank you for the years of good Internet tips, inside information and just generally all the good things Boardwatch has given me personally. However, I'm a bit concerned with the sudden disappearance of Chris Babb from your lineup of talented writers. To be quite honest, his articles were the main reason I finally subscribed to *Boardwatch*, instead of picking up that infrequent copy at the drug store. I liked the way he helped readers by highlighting the useful web sites that are sometimes buried in the useless heap of other less appealing sites. So, I'm just curious, what happened to Mr. Babb?

Did I miss something that was said in a past article? If so, please excuse my misinformation and kindly point me towards the month, year and article name that his departure was explained on.

Best Wishes,  
Dave Beal  
[dataphasia@juno.com](mailto:dataphasia@juno.com)

David:

*Boardwatch Magazine* is in a continual state of reinventing itself. I don't view this actually as anything current, past, or future, but a continual state since our first issue of March 1987. As a result, we have, are, and will add and drop individual columnists at any time, and in fact on whim.

*That said, Mr. Babb's disappearance was not in that category. It was more of a personal nature in dealing with an aging relative, who indeed passed on this past December. We consider it a "leave of absence" and in fact have already discussed his return. I too am fond of his humorous look at the vagaries of the online world, and am anxious to have him back. But occasionally, there are matters in life of more pressing urgency than documenting the SpamCam.*

*I'm very pleased you found his missives useful and interesting, and I was originally told he would be back in this March issue. There have been some further complications, but we both anxiously, and with patience, await his return. He still assures us he will be back.*

Jack Rickard



### FULL DUPLICITY

Hi Jack,

The magazine is great, I love the ISP Directory, you're a minor deity, yada, yada, yada . . . :-)

I've seen it stated or implied in a number of publications (including the Fall 1996 ISP Directory) that data traffic generated from an ISP's web site hosting eats into the bandwidth available for dial-in users. This doesn't make sense to me and I wanted to see what you think.

Say an ISP has a dedicated T1 circuit providing their connection from a national backbone. Also say that this ISP hosts numerous web sites. Dial-in users tend to increase traffic in the direction from the backbone to the ISP. The web sites tend to increase traffic in the other direction. Since T1 circuits are full duplex, it seems that one traffic type will have little impact on the other. In fact, it seems as though you're better utilizing a resource by moving as much data as you can simultaneously in both directions. You buy this?

My favorite read in your publications is when you put on your engineers hat and get into technical details (e.g. the recent article on 56 kbps analog modems). Please keep it coming.

Looking forward to seeing you at ISPCON 97.

Bruce McHollan  
[mchollan@daccess.net](mailto:mchollan@daccess.net)

Bruce:

*I buy it. I did imply otherwise in print. I stand corrected. T-1 circuits are indeed full duplex, and the web hosting function should not impair bandwidth to dial-up or dedicated access downstream customers whatsoever, with regards to bandwidth.*

*We did receive a strong response to the K56 article. More in this issue. And apparently I should be writing more of this sort of thing, and editing/publishing/managing less. That would suit me if we can just keep the company operating that way.*

*By all means, let's do chat in San Francisco at ISPCON 97 August 20-23rd.*

Jack Rickard



### BACKACHE

Dear Jack:

ARNet Inc. is a regional Internet service provider in the Texas Panhandle. Our backbone connectivity is currently provided by UUNET Technologies. As a provider who feels a duty to customers to provide the fastest and most reliable service possible, we are arranging additional backbone connections.

After many months of research and testing, we made the decision to purchase connectivity from Sprint and MCI. Your directory was an excellent source of information during this process.

Recently, however, we discovered a very disturbing fact. It appears that MCI has completely sold their T1 and T3 port capacity in many backbone cities, including Dallas, where ARNet would like to connect to MCI. This fact did not surface immediately, however. Our first indications of a problem were the stories we were getting from different MCI representatives. One said that they no longer sold T3 access. Another said they no longer sold access to any ISPs, the reason being a bad payment history among ISPs. To obtain the truth, we had to go "inside" the company to an acquaintance of mine who was previously employed at MCI and has several friends employed at MCI.

I certainly feel that it is within MCI's right to refuse adding additional ports. However, I feel their port capacity issue is misleading at best and a deceptive (illegal) practice at worst (considering their advertising). Through all of this, curiously, I have seen no press information about the issue.

Therein lies the reason I have written you. I feel the issue is important enough to merit more research and printed findings in your magazine, and possibly your ISP directory (which, through no fault of yours, leads the consumer to believe Internet connectivity can be purchased from MCI).

If you have any questions, please call me at my office on weekdays between 9 A.M. and 6 P.M. at (806) 355-3539. Alternatively, you may email at [dhudson@arn.net](mailto:dhudson@arn.net).

Daniel Hudson  
ARNet, Inc.

Mr. Hudson:

We are pleased to receive and publish your letter. I rather agree that we should cover this issue in both publications. And your experience is precisely why we have hesitated. You can get ANY story you like directly from SOMEONE at MCI, and it appears to all be entirely babble.

I don't know whether they do or do not desire to sell connectivity to ISPs at this time, and I am utterly convinced they don't know either. I rather do know they still sell T-3 connectivity, but no one in this company knows at what price.

We do know they DID have about a 70 day install time, but they were adamant that they could do so in 45 days. We cannot find anyone who has had one installed in 45 days, so this would appear to be a barefaced lie.

There have been multiple and continuous reports of pricing irregularities, not simply in a non-uniform pricing policy, but also in pressuring customers to sign agreements allowing them to change pricing at whim during a contract period. There are persistent rumors of customers who have been hit with price increases despite contracted pricing and terms. There are done deals that collapse at the last minute after 60 days of planning and commitment.

Part of the problem lies in the fact that MCI actually has MORE sales offices than they do POPs. The representatives are totally unqualified, in many cases, to sell a 2400 bps dial-up account to a Commodore 64 BBS much less to the Internet. In other cases, they are simply more interested in the more traditional line of telephone service which they do vaguely understand.

That said, we are sufficiently comfortable at this point to say that the problem comes directly from the top. Their Chief Technical Officer is Fred Briggs, a man of profound arrogance only limited by his own lack of vision, who it would appear has actually issued a gag order to all MCI employees preventing them from discussing any details of their backbone or network.

About six months ago, we found a very interesting document on their web site that basically advised customers that in shopping for an Internet connection, avoid any vendor who would not show you a detailed diagram of the backbone — they could not be reputable. MCI has not released such a diagram since June 1996, despite a much ballyhooed \$60 million backbone upgrade to 622 Mbps — or so we are told. The original document on the web site that would appear to be in conflict with this has, of course, disappeared mysteriously. We still find it good advice, and urge you to apply it to MCI.

We wrestled with this for the March/April directory issue. For a while, I favored variously: 1. Leaving them out altogether, 2. Replacing their backbone map with a Darth Vader helmet graphic, or 3. Doing nothing for one more issue and seeing if this BT acquisition would sort itself out.

At this point, for the May/June issue, I'm favoring the Darth Vader cover approach, along with some pointed comments to the FCC regarding the merger/acquisition.

The bottom line is that at this time we do not recommend this company for any type of Internet service. All reports of their connectivity continue to be reasonably favorable, but their business practices are deteriorating to an alarming level. They have basically "gone dark" with regards to information about their service, and if it were my guess, I would say they have succumbed to the almost irresistible urge to steal the Internet, shut out all other players, and rely on their size and vast resource to pull it all off.

I can only say this about that: It is my observation over fifteen years, that there has always required a certain generosity of spirit to play in the online game. I've never seen an exception. If you don't know what I'm talking about already, you lose. You can't play. And no matter what the size, or what the resource, it always works out that way. MCI is investing a lot in the Internet, and that allows them a substantially larger scale of loss if they succumb to their own arrogance.

As I've mentioned before, the world will readily forgive arrogance for its brilliance. And it will even forgive stupidity for its charm. But in combination, they are essentially fatal without exception. I know this is hard to fathom given the position MCI is currently riding in. I would note that I gave Apple Computer 36 months to live about 30 months ago, when they seemed invincible.

Fortunately, there are other backbones. I would like to see more people use them.

Jack Rickard

◆ ◆ ◆

Hi

You may enjoy my new site:

<http://www.SEXtrivia.com>

Don Vayle

[donvayle@erinet.com](mailto:donvayle@erinet.com)

Don:

May I? Why thank you...

Jack Rickard

◆ ◆ ◆

#### SEARCH ENGINE COMMENTS

letter in Feb. 1997 *Boardwatch*

Jack,

Ted Goldsmith's letter about <META> tags (*Boardwatch*, Feb. 1997) caught my eye, as did your response, and I thought I might have some information that would interest you. In 1985, two researchers, David C. Blair and M.E. Maron, published in Communications of the Association for Computing Machinery the results of a study (known as "the STAIRS study") they carried out on full-text searching in a large database (at that time, "large"

meant about 350,000 pages of text). Briefly, Blair and Maron evaluated results the database searchers themselves considered successful, a standard the searchers set at not less than 75% recall (meaning that a successful search had to retrieve at least 75% of the documents relevant to the search request). Blair and Maron reviewed successful searches to see whether the searchers had been as successful as they believed. Blair and Maron found that although the searchers thought their successful searches were retrieving (on average) about 80% of the documents relevant to those searches, the searchers were in fact retrieving (on average) 20% of the documents relevant to the searches.

I came across this study while writing (with my wife) a book about computerized research for lawyers (*Using Computers in Legal Research: A Guide to LEXIS and WESTLAW*, published in 1994 by Adams & Ambrose Publishing). The article led me further into some of the technical literature on full-text searching, and I had some correspondence with David Blair as well. It turns out there's a phenomenon in full-text searching that's known as the recall/precision tradeoff. Recall measures the percentage of \*all\* relevant documents retrieved by a search, and precision measures the percentage of relevant documents in a collection of documents actually retrieved. To put it more mathematically:

number of \*relevant\* documents retrieved  
recall = number of relevant documents in the  
database

number of \*relevant\* documents retrieved  
precision = total number of documents  
retrieved

So, if a database has 100 relevant documents and a search retrieves 20 of them, recall equals .2 (or 20%); if a search retrieves 25 documents and 20 of them are relevant to the search, precision equals .8 (or 80%).

One leading expert in this area wrote soon after the Blair and Maron study appeared that "[a] well-known rule of thumb in text retrieval is that increased recall is gained only at the expense of a loss of precision, and vice versa." (Jon Bing, "Performance of Legal text Retrieval Systems: The Curse of Boole," 79 Law Library Journal 187, 196 (1987).) In effect, recall % = (1-precision) x 100 (approx.) precision % = (1-recall) x 100 (approx.)

The roots of the recall/precision tradeoff lie in the conformity of all natural languages (English, French, Chinese, etc.) to what's known as Zipf's Law, which describes in mathematical terms the distribution of words in a language. (The original explanation of Zipf's Law appears in George Kingsley Zipf's book, *Human Behavior and the Principle of Least Effort*, published in 1949 by Addison-Wesley Press.) In effect, the invariability of the structural characteristics of natural languages presents a significant barrier to effective full-text searching.

I know 1985 seems like a long time ago, especially in computer years. But the Blair and Maron study is still cited favorably in the professional literature, an honor not many pieces dealing with computers can claim so long after their publication. In addition, in 1994,

at a leading international conference on information retrieval, Howard Turtle, the architect of the natural-language search engine used in WESTLAW, presented a paper that incidentally showed that the recall/precision tradeoff occurs with natural-language searching as well as Boolean searching. (Howard Turtle, "Natural Language vs. Boolean Query Evaluation: A Comparison of Retrieval Performance" Proceedings of the Seventeenth Annual International ACM-SIGIR Conference on Research and Development in Information Retrieval [aka SIGIR '94], pp. 212-20.) David Blair (who teaches at the University of Michigan) has also written further about the STAIRS study, including a detailed discussion in his book, *Language and Representation in Information Retrieval*, and a follow-up article titled "*STAIRS Redux: Thoughts on the STAIRS Evaluation, Ten Years After*" in the January 1996 issue of the Journal of the American Society for Information Science.

Goldsmith's suggestion of using <META> tags to improve Internet searching makes a lot of sense because the tags would ameliorate (though not provide a cure for) the recall/precision tradeoff. For example, lawyers have long had the benefit of a similar system for research. For decades, lawyers have used case digests to facilitate legal research. A case digest rests on a structure of topical categories that methodically outline legal principles and other characteristics of court decisions that lawyers might want to locate. Publishers that provide case digests have editors who review cases and assign them to whatever digest categories seem appropriate, and a case can have as few as one of these topical "tags" assigned to it, or as many as dozens. These law-oriented topical "tags" have long facilitated research by helping lawyers home in quickly on relevant cases while simultaneously bypassing most irrelevant ones — exactly as appropriately implemented <META> tags could do for Internet documents.

A <META> tag system works, however, when there's a prearranged, agreed-upon structure that allows authors, editors, or indexers to assign similar documents to commonly accepted, predefined tags; that's why the case digest system has worked so well for so long for lawyers. Without a common structure of this sort, the information in <META> tags begins to take on the characteristics of a natural language, leading us back to the recall/precision problem. The principal barrier to a coherent <META> tag system lies in the difficulty of creating a sufficiently sophisticated categorization scheme that (1) people will agree on, (2) people can easily use, and (3) people will actually use. The anarchic nature and rapidly growing size of the Web probably preclude creating a system of this sort, at least for the foreseeable future, leaving <META> tags unable, regrettably, to fully provide the benefits they potentially offer.

Chris Wren  
Madison, Wisconsin  
[cgwren@wisconsinlaw.com](mailto:cgwren@wisconsinlaw.com)

Chris:

*Let's talk about that for a minute. I'm hearing a lot of this these days. The Internet is big,*

*and it takes a certain threshold level of adoption before anything works, so nothing works, and we might just as well save ourselves the effort and give it up.*

*I guess I came from such a time when things were so small, that I have trouble grasping this. The online community has ALWAYS required a threshold level of adoption for anything to work. That's the climb up the hill. The nice part about being at the TOP of the hill, is that in the online community, you can reach that threshold with alarming rapidity. I've watched a single software program take hold across the country within the space of a couple of weeks.*

*The important part is that almost everything you see and use started as an unspoken idea within the cranium of one individual. That is the germ. I have personally witnessed about a dozen idle conversations, held within groups of in all cases less than six people, that have later changed the online community forever. That it started as an idea sketched on a napkin between four guys who dress funny, don't exercise enough, and have to get sunshine by mail-order, doesn't seem to slow it down. It's part of the lead, follow, or get the hell out of the way nature of this thing. Poor ideas dry up and die rather quickly. Good ones have never failed from lack of resource or instant group sanction. If you and Goldsmith already agree on how to do it, bring on a couple of guys that can make a search engine recognize them, and start your engines. If it works usefully, you'll be standing around gawking at how quickly it took off. Every single venerated innovator I can think of, has regaled me with tales of how they "Just wanted to do this one small thing, and never had any idea it would grow into the monster it has become."*

*So the threshold cuts both ways. When you face it, it seems unassailable. If it's working in your favor, you can't quite believe it took off so well. But it usually requires an idea, a couple of people to implement it, and a little luck.*

*The search engines are no longer useful. They are now a problem. If you can solve it, go girlfriend. Make up some categories, some tags, and show us.*

Jack Rickard



#### PRI VS. CHANNELIZED T-1

Jack,

I've seen you mention that PRI is a superior digital connection compared to channelized T1. For true-data uses, I can see that being the case (64k vs. 56k), but I am not certain about analog. As I understand it, a PRI receiving a voice call (as X2 would be) runs the channel at 56k, since that is (was?) the standard.

If it can run 64k, there may still be issues since I understand that 64k trunks are a scarce resource between COs, and as many calls as possible are carried on 56k trunks, as I am sure plain old voice would be.

Anyway, my main point is that the voice network is predominantly 56k, so PRI shouldn't

have any advantage over channelized T1. Have you been able to positively find otherwise? Yes, I am asking because we will be using channelized T1. (Although we have some PRI)

Oh, one note: In the Jan '97 **Boardwatch** issue, you listed Pac Bell as having some very low rates for PRI service. I would like to point out that the price you listed does not include the T1 trunk between the ISP and the CO. Pac Bell makes you pay both ends of the T1 termination (vs. just one side with Pac Bell Frame Relay), so it turns out that PRI from Pac Bell really ends up being about \$600/mo after you add in the T1, PRI Service, and the PBX trunk (the number actually dialed).

Brian Curnow  
[bcurnow@sonnet.com](mailto:bcurnow@sonnet.com)

Brian:

*Yes, there is an absolute advantage to PRI over channelized T-1 though I must qualify that with "in some cases."*

*The qualification is that some channelized T-1 lines actually are 24 channels at 64 kbps. But others used a technique called ROBBED BIT to use the least significant bit of each 8-bits as an administrative sub-carrier to handle the forward on busy, call setup, call teardown, etc. This reduces the 64 kbps to 56 kbps.*

PRI ISDN usually has 23 64 kbps channels and 1 64 kbps supervisor channel, although now there is ALSO a 24 X 64 kbps all data service under PRI ISDN in some areas.

In any event, while the end objective is a 56 kbps downstream connection, there is actually a more loose relationship between the 64 or 56 kbps data channel from ISP to CO, and the ultimate 56 kbps the end-user sees. Early tests make this look more like 48-53 kbps actual performance if the channel from ISP to CO is 64 kbps. If you reduce that channel to 56 kbps, you will lose on the order of 2-4 kbps in performance from the currently extant 48-53 kbps.

Note that this is true whether the 56 kbps robbed bit link occurs between the ISP and the CO switch, or between the CO switch and a Digital Loop Carrier (DLC) used to extend the CO to a distant suburb. The two are not cumulative, but if either occurs, the minor performance penalty will be paid.

Jack Rickard



#### CABLE MODEM ACCESS

Recently I read a letter in the February issue regarding cable modem access to the Internet. You had asked the writer to let you know what he thought about the access so I figured I would let you know about my cable modem access experiences.

I live in Edmonton, Alberta, Canada and in December of last year one of the two local cable companies, Videotron Communications Ltd., announced it was "delivering" high speed cable access to the Internet. Like most



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Internet users when I was offered a substantial higher amount of bandwidth than my dial-up connection was providing me I decided to try things out, so I got hooked up with them.

They offered everything, rental of the cable modem, purchase of the network card (a low \$25 CND!), a static IP (handy in a lot of cases) and the first month free. The cost is \$50 CND per month. Not to bad considering what I was paying for dial-up. I noticed a few things when they installed it for me. The first thing they did was what I would term a whooping, to make me like what I had just purchased. They did a download from one of their FTP servers of a 5 meg file. To my surprise, which is what they hoped to get, it only took 15 seconds!

That took a little getting over, well, OK, 5 minutes did it. What I was really interested was how good the connection to the rest of the Internet was.

So, I started surfing sites and downloading data for the sake of seeing what the transfer speed was like. Typically it was great! Web sites load up in a flash! A download of a one meg file off the net now take around one minute or so. Some sites were pretty bad relatively but still much better than my dial-up. The upload speed is a different matter though, instead of a claimed 4-5Mbps like the download the upload is only 300kbps or so. Oh well, still better than dial-up. :) One of the biggest test for me was the online gaming. I'm a huge fan of online games, (i.e. Quake) and for me a true test of the connectivity was how well they run over the 'net. Well, now I can hardly tell the difference between playing alone or playing a multi-player game over the 'net. Ping times are great and the interaction seems perfectly smooth.

After having used this for over 3 and a half weeks, nearing the end of my free month people are asking me whether I'm going to keep it or not. For me, the answer is yes. As an ISP, the cable company hasn't done too bad. There have been a few quirks and problems. A few things lacking at first but like good consumers the cable customers made loud noises and are (sort of) getting what we want in an ISP. =20

After having a taste of the high bandwidth and jumped right over the new 56kbps technology, I could not imagine going back to dial-up.

Keep up the good work!

Michael Ferguson  
[mcfev-wave.com](http://mcfev-wave.com)

Michael:

*Thanks for the note and the first-hand experience. I don't think anyone questions that higher bandwidth is good. The question is whether cable companies are willing and able to deliver it. It sounds like you have a win in Edmonton.*

Jack Rickard



#### ISP VALUE — RULES OF THUMB

Jack...I read with interest your editorial in the February issue about the future of ISPs. I agree.

In looking at expansion and growth, as with other industries, one must look at acquisitions among other methods.

How does one value an ISP — per subscriber, per year of successful operation, per POP, per market share in an area, by capital investment, by number of employees, by profitability, by revenue, by....

Can you help with some rules-of-thumb for ISPs????? Are there any industry averages?

Thanks for the help.

Regards,

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Ochain International Corporation  
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(508) 428-0880, fax (508) 428-5155  
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rue de la Presse, 4 B-1000 Brussels BELGIUM  
+32 2/217.80.80 fax +32 2/218.31.41

David:

*That's a \$64 question and this is a \$36 magazine. Everyone seems to have an opinion. I guess in the dial-up business, the most frequent methodology is on a price per subscriber. This price would vary around such variables as the monthly subscription price, the churn rate, and growth. The few public deals I've seen seem to run about \$200 to \$230 per subscriber — nearly a year's revenue. I guess I think that's pretty high given the ease with which subscribers can change service providers.*

*For ISPs more oriented toward dedicated access connections, it becomes more difficult. Profitability in this business is apparently optional — you can put it all back into growth or take it out at will so it becomes sufficiently variable as to be essentially meaningless. And that leaves us with some multiple of gross annual revenues, with a multiplier of something between 3.5 and 4.5 for Internet service providers extant currently. Under this concept,*

*an ISP grossing \$2.5 million annually would be worth roughly \$10 million, in theory.*

I cannot explain the obvious disparity between the two methodologies.

Finally, if you kill a chicken and closely examine their entrails by the light of pure white candle.....

Jack Rickard



#### KUDOS

Jack,

You are doing a great job at "Boardwatch." I enjoyed reading this morning the front backbone providers section of your special ISP issue.

Texas.Net would like to advertise in the next issue.

I copied your essay on 56K modems. It was such a technical yet down to earth article. I handed it to my wife so she could understand better the issues we talk about. Hey, I learned in there too. Pat on the back to Gary Funk too.

The head of Be Inc. just mentioned you kindly in the BeOS newsletter.

Best in 1997,

Ronald Barron Yokubaitis  
[rony@texas.net](mailto:rony@texas.net)  
Texas NetWorking Inc.

Ron:

*Thanks for the words of encouragement. We're trying. Gary's near to a nervous breakdown, but still plugging away.*

Jack Rickard



#### ARE SEARCH ENGINES OBLIGED TO INDEX EVERYTHING?

Mr. Hakala,

I must admit that I found your response to Mary Jane Colombo's letter regarding dissatisfaction with Yahoo! a bit off the mark, especially your accusations of slander.

While I can't address the motivations or incentives behind Ms. Colombo's letter, the fact remains that from my experience, her assertions appear to be absolutely true. You can't slander someone with the truth.

You point out that Yahoo! is an edited database, and that its management is under no obligation to accept submissions. Are they also under no obligation to maintain correct information once a listing has been accepted?

In early December, the ISP hosting my web site announced that they were going out of business on the 30th of that month. That location had been listed with Yahoo! for several months. In less than one week, I had

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made arrangements with a new hosting service, moved the site, and established pointer pages at the old URL. The first thing I did after the move was resubmit my URLs to the various search engines and databases.

Well, here we are, over two months later, and Yahoo! has yet to update my listing. If I attempt to follow up on the request, Yahoo's own pages will insist that they are two weeks behind, and that tardy listing updates should be resubmitted. I have done so twice, and would submit them again, except for the fact that I haven't been able to contact the host add.yahoo.com at all for nearly two weeks. I reported this situation to their feedback address, but received no acknowledgment.

There really could only be two reasons why my listing hasn't been updated. The first is that they are just so swamped and far behind that it hasn't been done, as was asserted in Ms. Colombo's letter. This implies that the whole of Yahoo! is more than two months out-of date.

The second reason, as you suggest, is that they have exercised their right to refuse my update requests, and simply decided not to tell me about it. If this is the case, why leave the listing at all? As it stands now, the broken listing for my site is worse than no listing at all. If a Yahoo! user clicks on my link, they get an error message and that's it. They don't try again. If there were no listing at all, at least the search would be handed off to Alta Vista, which has listed the correct URL since the beginning of January. If Yahoo! has arbitrarily chosen not to update my listing, I wish they'd just delete it.

Frankly, I think the first reason is far more likely to be true. Yahoo! appears to be hopelessly behind, yet spends its time and energy dreaming up gimmicks and filling its pages with banner ads and OJ Simpson news instead of maintaining the database that has made it so popular. If Yahoo! is that far behind and won't admit it, then Ms. Colombo's question, "How long can Yahoo! continue to operate on reputation alone" is valid.

I didn't ask for "guaranteed market exposure", as you suggest. I simply asked for, and was granted, a listing on the best-known search engine on the web. Now that listing is long since broken, and it needs to be updated or deleted. The fact that I paid nothing for the listing was by their arrangement, not mine, and I disagree with your implication that anyone who would expect Yahoo! to maintain a correct database in a timely fashion is a "freeloader".

Cordially,

Scott Withrow  
Center Point, IN  
[sswitchrow@ccrtc.com](mailto:swithrow@ccrtc.com)

Scott:

David's gone, and I rather fall into your camp on this one. I think the operators of Yahoo should be able to have it anyway they want it, I just don't think they can have the good without the bad. If they claim to be a search engine, some legitimate effort should be made to keep it up to date and process URL updates

in a timely manner. I also don't think it's too much to ask for them to provide a response in the negative if they have decided not to include it.

But I rather gather they are spending most of their waking hours attempting to glean revenues from this service — much touted and much accepted as being free.

But aside from the arrogance of Yahoo, the basic search engine concept is breaking down. Ultimately, I don't think a fix is the fix. We need a new approach.

Jack Rickard



### CONNECTING YOUR BUSINESS

Jack:

First, as is customary and completely justified, let me add my voice to the chorus of applause and appreciation for **Boardwatch Magazine**. Every month is filled with straight, clear information and perspective not available elsewhere. Keep it up.

In regard to "Connecting Your Small Business to the Internet" in the Feb97 issue, I have two questions I'd like to run by you:

1. The connectivity alternatives material is clear and concise. The one part I'm a bit confused by is the role played by the IPAD in Figure 3 on page 64. I assume the Ascend Pipeline would handle the switching/routing/addressing issues - is the IPAD just there for DNS, POP, and SMTP server functions?

2. Can the Domain Name Server infrastructure be set so that different servers within the same high-level domain are actually attached via entirely different sub-nets? That is, if my organization were Puppies, Inc., and I had registered [www.puppies.com](http://www.puppies.com) with the NIC, could I contract with two different service providers such that one hosted and operated mail.puppies.com (both pop and SMTP servers, and also functioned as ISP for my own connectivity) and the other hosted and operated [www.puppies.com](http://www.puppies.com)? (Alternatively, could I host [www.puppies.com](http://www.puppies.com) myself, and contract with some vendor for mail and ISP-type services?) If so, how would you suggest managing the DNS tables?

Thanks.

Steve Charloff  
Raleigh, NC  
[charloff@rightbrainmedia.com](mailto:charloff@rightbrainmedia.com)

Steve:

Yes, the Ascend Pipeline quite effectively handles the switching/routing/addressing functions in the ISDN connection to the Internet example. The IPAD does provide the DNS, SMTP, POP3 functions. But it also acts as a dial-up terminal server, ftp site, finger server, and even web server if you're not too ambitious.

As to your second question — yes it can. What you describe cuts a number of different ways, but once you ARE your own authoritative

name server, you can point to a machine in Botswana by IP number to handle your mail, a different one in Australia to be your web server, and in fact you could have one machine do incoming mail, another do outgoing mail, another yet be your ftp server, etc. etc. I don't know why you would want to point to an ISP for SMTP service if you are up on a standing link, but it could certainly be done.

We have three web sites on two different machines all on the same network. We host a [www.humvee.com](http://www.humvee.com) web site here and to do so involves a single entry in the DNS table on an IPAD machine. If you want to get into advanced tricks, we can perform a crude kind of round robin DNS where users come in through two entirely different T-1 lines to access the SAME web server — effectively splitting the traffic to a single web server across two different providers and two different backbones.

We should probably do some more detailed work in **Boardwatch** on DNS, but it quickly gets pretty wild. As we said in the article, O'Reilly's book on DNS and BIND is just the best thing out there on the topic. And if DNS is your only interest, Linux or any UNIX can do it and soon I think the Windows NT will be essentially capable in this area as well. The IPAD has a rather simple text configuration file that is pretty easy to deal with, and it handles a lot of other similarly important but non-glamorous chores with minimum learning curve.

Jack Rickard



### ACCESS FEES FOR ISPs

Dear Jack,

I've been solicited several times, of late, to file a protest to the present telco petition before the FCC to permit per minute usage charges for Internet access. I admit to not being polarized enough on the issue to have read all the materials suggested by the anti-petition forces, but a question arises as to the necessity for all the hue and cry. I thought deregulation gave the telcos pretty much a free-hand in setting rates for such "special" items as net access. But in any event, with as much competition as apparently exists, I would assume that some access points will charge per minute, some won't, some will be above the \$19.95 "standard," and some below. We've got one ISP here in Nashville offering unlimited at \$10 per month. I believe there are a great many more telcos than those we see on the overly redundant TV commercials, so I assume competition will increase as further deregulation takes effect.

I see an analogy in electrical transmission services. I live in a TVA govt electrical power monopoly service area. That is being deregulated and I am now being solicited by several power suppliers other than TVA & my rural electrical membership cooperative. I assume it is at least as technologically difficult to provide sufficient power in all weather conditions, as it is to provide telephone line access, and I understand that power companies borrow from each other to maintain supply when

critical areas go down. It would seem that eventually the telcos will be more like the electric power suppliers and will build plant facilities to answer increased demand, and will charge whatever the market will bear.

I would assume that there will be some changes in access fees, maybe offering access fees based on limited time on line. A local ISP has for years offered 2 hours per day for a very reasonable sum, about \$82 a year, and now offers unlimited access at \$190 something a year, well below all the telcos. I find that a 2 hr a day limit is more than enough for my usage, which is mostly email, some shopping. I bought my Motorola BitSurfer Pro ISDN modem on line at a nice savings, but I hardly spent more than 30 minutes searching. I chose BellSouth as an alternate ISP mainly because my grandkids, when they visit, can spend many hours on the net.

Another mystery, BellSouth charges no more for ISDN access than for analog. Neither does The Nashville Exchange, my original ISP. It cost me \$49 to install ISDN and \$26 a month. Microsoft wants \$49 a month for ISDN access. I hear of outlandish pricing in other states. I don't know why Tennessee is so much cheaper than other areas, but I shan't complain.

Back to my original question: Do you think the telco petition before the FCC is a matter for concern, or are my instincts as to market rule valid?

Best regards,  
Ray L. Walker

Ray:

*It certainly is a matter for concern. My read on this is that there is no sentiment for this within the FCC, but it may be easier for them to cave on the issue than defend it. I understand they have received over 100,000 e-mails on this issue, and it will be interesting to see how it is resolved.*

*ISDN was originally designed and predicted to be priced at 1.5 times the basic POTS telephone service, while providing effectively two lines. Two issues come into play here. First, the telcos never did get on board with why anyone would want to buy it. And second, they didn't understand that if anybody did, why everybody wouldn't. The 1.5x was actually based on replacing current telephone service with ISDN, and for many people, particularly those with no data need, it doesn't make any sense because the customer premise equipment to DO two simultaneous telephone calls was too expensive. In any event, it has devolved in some areas to a cream skimming exercise at an exorbitant price.*

*The basic argument that the telcos use with regards to the access charge is that they are experiencing very high loads on their switches from the data traffic and somehow the ISPs should pay. See our March editorial and the letter from Scott McClellan of US West. This derives from a pathetically artless "study" with almost no study behind it, released last year by Bell Atlantic. The basic premise is that data calls are of longer duration than voice calls - a characteristic everyone has known about since 1983 at the latest. That they have "discovered" this is indicative of part of the problem.*

*What they neglect to say is that the local telephone companies have reaped about a billion and a half dollars in the last couple of years in second line installations SOLELY for use by consumers dialing the Internet. The telcos have spent about a quarter of billion in that period upgrading the network. So they already have the money.*

*Further, the network is under no great strain in an overall sense. The local switches have to be designed for peak usage, not average usage. Peak calling periods voice are 10:00 AM to 11:00 AM and a smaller peak in the 4:00 PM to 6:00 PM period. Online usage peaks run 8:00 PM to 11:00 PM — actually a low period for voice traffic. This basic usage pattern is actually what birthed CompuServe as Microserve in the late seventies. Online activity was designed to use off-peak computer network time that was essentially IDLE. It is so with voice telephone networks.*

*I mistakenly ignored the Bell Atlantic study thinking it was so trivial, and so poorly documented, that it would be dismissed. Instead, the other RBOCs began pasting everyone on four continents with photocopies of it as if it had some merit. It does not.*

*We are into a kind of final reality zone where the RBOCs are starting to "get it" that the ISP business has some icky parts, and if they win completely it doesn't actually generate enough revenues to be of interest to them. But it does compete with some of their cash cow services. I would expect this year to see a series of moves where they appeal to the FCC, the courts, and the Congress, to somehow legislate ISPs out of business.*

*Should you be concerned? Actually, you probably should be, as incredible as it sounds. I watched these people convert Al Gore from an effective cheerleader for online networking, into basically sitting down and shutting up, for some contributions that don't frankly appear to amount to more than about \$40,000 total. I couldn't believe what I was seeing. But it appears to have happened. They have a lot of your money, and as is becoming apparent from the current investigations into campaign fund raising efforts, you can buy quite a bit of influence in that town, at the very top levels, for essentially chump change.*

*We should probably have taken a stronger stance on this. But it felt to me like wrestling with whores for quarters, and my heart wasn't in it.*

Jack Rickard

♦ ♦ ♦

#### GREAT MAGAZINE !

Jack, **Boardwatch** is probably the only magazine that I have read that is truly in touch with the ISP and Internet industry. My company is based out of Boca Raton, Florida. We are an ISP that specializes in the needs of the business user. I found your article (along with many others) "Connecting your Small Business To the Internet" a very well written and informative article.

Our company has maintained a vision with exactly that in mind. We expect to continue adding value added services as the market demand increases. My belief in our vision has propelled our ISP business into profitability

within the first 6-months of operation and we continue to grow at a rate of 10-15% /per month without doing ANY advertising or promotions. With all the hype going on now in the industry related to "will the small ISP survive?", I must say, I see how some are not. I believe in this business you cannot give your service away and I think too many new startup ISP are doing just that. Anyway, being that you seem to be in touch with so many ISPs across the country, What and Where do you think small ISPs should be focusing on for 1997/98?

Thanks in advance...and keep up the GREAT work at **Boardwatch** !!

Andrew Massias  
President/WamNetRunner  
[andrew@wamnetrunner.net](mailto:andrew@wamnetrunner.net)

Andrew:

*Very pleased you find our efforts useful. As to what ISPs should be focusing on in 1997/1998, I'm not sure. I can share some thoughts as to advantages independent ISPs have.*

*Customer Service. This is very difficult to scale up to large size. Focus on not only delivering the service, but taking advantage of the fact that you have. ALL businesses are PEOPLE businesses and we buy mostly from those we trust and have a relationship with. If an ISP I'm connected to comes to our office with some great new gadget gizmo, a different kind of connection, etc., he gets a very different reception than the direct mail piece that comes in the mail or any contact from a stranger. This, I think, is currently popularly referred to as relationship marketing. Get some customers, treat them like kings, and then try out new product ideas on them. Don't be afraid of marketing hardware, software, or anything you think will help them and give you a little extra margin. And leave these people with the sure sense that they will be happy to see you come around next time. Build the relationship, not the sale.*

*Stay light on your feet with regards to technology. The primary reason all the consolidation prophets have erred is they have no feel for the relative maturity of the technology. Small ISPs can hear about some xDSL technology, a wireless technology, or for that matter a 56 kbps modem technology, and literally be playing with it the next week. If it looks promising, they can have it up experimentally in two weeks. At the end of three weeks, they can be deploying it and marketing it to their customers. This is a deadly weapon. Use it. If it makes your last year's investment in bargain 14.4 kbps modems look a little like a loss — eat it and move on. Take comfort that it wasn't \$300 million, which is what the big boys get to eat.*

*Look for complementary talents. Every ISP I know of is talking about how they are moving into web hosting. How many have hired really talented graphics professionals, or experienced Madison Avenue advertising salesmen, or any type of media person? If you want to do this stuff, avoid becoming part of the "we do web for food" crowd and get some different types of people into your organization that can broaden you into those areas more effectively.*

*Marketing. So far, ISPs have marketed their services by answering the phone, most of the time, when it rings. A few have actually gone so far as to squirt some e-mail uselessly into the ether. Even for a small operation, such things as a professional looking brochure, a little direct mail, some point of sale displays in local stores, advertising, and having someone in your organization solely devoted to the task of promoting business, is not a heretical approach. It might be more effective than lowering your prices and hoping for some of that good old "word of mouth" advertising that seems to be everyone's excuse for not having any.*

*Online sales. Get ready. The old online store concept is so careworn everyone is discounting it. I think this year, probably latish, it will become apparent that it finally showed up in town in a big way. I'm quickly reaching the point that I'm annoyed at anything that ISN'T available online, and I think the basic change in human behavior necessary to get online sales off the ground is about to cross some kind of threshold. I hate to be vague about this, but it just "feels" like something is about to break loose here in the realm of human behavior, buying patterns, and acceptance of the online milieu as a way to buy things. When it goes, the numbers get very big very fast, and little guys can play too. Start putting people up on your service for a cut of the action, on long term agreements.*

*There's five quick thoughts — at two cents each. And you got it all for \$36 — all the rest is free.*

Jack Rickard

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#### BOARDWATCH WEB SITE

In the "old days," Jack Rickard published lists of BBBs sorted by telephone numbers in **Boardwatch** magazine because, as I see it, he thought that this was a good way to help the world keep its feet on the ground. Jack Rickard made **Boardwatch** successful because of the logical and rational way he advocated his project. Since then the Internet has replaced BBBs and the **Boardwatch** web site no longer seems to reflect Jack Rickard's logical grounding.

Like most sites on the Internet, the **Boardwatch** site is overrun by "cute." For instance, I'm looking for a local ISP. On the **Boardwatch** web site I selected "Find an ISP" from the menu only to find a map with yellow spots. My 800x600 screen obliterated most of the map and most of the yellow spots. Plain to see though, special software which I don't have was required to use the map. "Cute" obliterated access to the information. A list sorted by area code and exchange numbers would have provided the information efficiently. A masked sorted list would have provided it in a clever manner. The map was neither efficient nor clever.

Now, there is the problem. The world, and especially the web, has replaced cleverness with cute. In some sectors of the world they are the same, especially in the world of fantasy. But, in the world of reality, they are opposed. Cuteness obliterates cleverness whenever there is purpose other than enter-

tainment. And, the purpose of the web should not be limited to entertainment, but should serve as a repository for and a distribution system of information.

**Boardwatch** used to be the acme for the dissemination of information. Its web site is not! I'm one who wishes **Boardwatch** would recover from its infection of "cute" rather than be replaced by someone else who can advocate resistance to the disease.

I realize that if I buy or get the latest hardware and software, I can have access to this information too. But, most of us aren't joining the race to buy just to keep up. That would make information a hostage of the sellers. Yet, that is just what is happening.

I also realize that the reason for advancing the quality of glitz on the Internet is to make the Internet more advantageous to commercial advertising. Cute sells and something has to pay for the Internet. Commercial advertising is the technique currently selected. However, as I see it, the Internet will be a commercial advertising media with information filling the spaces left over. Look at commercial television as an example. News shows on television (emphasize shows) may contain as little as five minutes of news in each half hour. The rest is filled with commercial interest. Other shows descend to the most banal instincts of viewer to gather the greatest number of people to view commercial messages. The Internet will follow suit.

My point here is not just the obvious as stated, but also that I am sorry to see **Boardwatch** join the trend. **Boardwatch** fought the good fight and gave in, I'm afraid.

FREDKLO@aol.com

Fred:

*I too miss the days of command line interfaces and 300 baud acoustic couplers. I'm with you buddy. We ought to wipe out all this graphical smaphical interface, all of this crass commercialism, and go back to just you and me, and our three friends, and the little club we had in 1980. Those were the good old days weren't they? By gosh, we could swill a few Pepsis, hammer out some assembly language code, and load some octal then heh? Eh, Fred? And all in 8 KB of memory too by God. Yessir. And none of that Windoze neither by gum. Tele-video. Bill Godbout. Software should be free.*

*Wake up Fred. We always wanted to be cute. The reason we weren't cute was because the tools were too crude and too awkward. They're not any more. Or at least not so much so. I rather don't think of **Boardwatch** as cute now, but it's rather intriguing to contemplate that someone, somewhere, thinks so.*

Jack Rickard

◆ ◆ ◆

#### 56Kbps MODEMS

Jack,

Just wanted to let you know that I really enjoyed your definitive masterpiece on

56kbps modems. As so frequently happens with your magazine I found myself hoping the article would never end.

Also, thanks for bringing back Doug Shaker.

As always, I wish you and your staff continued success.

Dale Hempen  
Englewood, CO

*Thanks for writing Dale. I too am very pleased Doug is back. His writing is just very good.*

*As to the article on 56 kbps modems, rest assured that it DIDNT end. We just had to cut it off at that point in our January issue. I rather think this story will continue to unfold throughout the year.*

Regards;

Jack Rickard

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#### SINGAPORE

Hello Jack,

Many's the time over the past year that I've been a subscriber when, after racing through the latest issue of **BW**, I've exclaimed to my spousal-unit, "I've got to email Jack about this!" What has finally motivated me was the piece in the Feb 97 issue, "Singapore: An Asian Tiger With a Worthy Internet Presence". As an American who has been residing in Singapore for nearly three years, I thought I could add some on-the-cyberscene comments.

The author (apologies, we use the British spelling here) states that "What is surprising about Singapore is that there are just these 3 ISPs in existence" and goes on to comment that this must be because the Net is "relatively new in the Far East". His quaint use of the term "Far East" aside, net access is restricted in Singapore because of government regulations, not because of it's youth. In contrast, Hong Kong has dozens of ISPs and pricing comparable to that in America. Come July this may change, but for now that is the situation.

Singnet is a part of Singapore Telecom, the government telco (and the only telco, though another is rumored to be coming in 98). Singnet went up in mid-95, shortly after we arrived in the country, and I jumped on it right away. No SLIP/PPP at the time, that took another six months. Pacific Internet and Cyberway (the other two ISPs) came on the scene in 96, but only affected end-user pricing in a modest way. It still astonishes me that the only unlimited access scheme is offered by Pacific Internet at US\$71/month! Even more disgusting is the appallingly poor customer service one receives for this price. There are local numbers for AOL, MSN, and CIS members to use - but who cares (and they charge dollars/min).

As for having Web sites hosed here, you've got to be crazy to do that. The cost is triple what it is in North America. My wife and I both run several sites, but we have them located in the USA or Canada, where rates are reasonable. Part of the problem is the telco monopoly

keeps line prices high; US\$6,000/month to lease a T1! This short-sighted attitude seems at odds with the government's stated policy to have all of Singapore wired as an "intelligent island" (whatever that means, I thought intelligence was a human characteristic). And even though 70% of the world's PC hard drives are manufactured here, computer hardware consumer prices are significantly higher than in the States.

What the author missed reporting on is the most interesting online story in the country; the imposition by government order last September of Web proxy server filters, which must be utilized for accessing all out-of-the-country sites. Not only did this slow down access, it drives us crazy when trying to test newly uploaded Web pages; often you don't get what you just installed on your server, you get the old (locally cached on the proxy) version.

Of course the government did this to "protect" the citizenry from all those nasty things out there online. They seem to privately admit that it is only a token effort, but governments relish superficial positions. There may be a few hundred blocked Web sites as a result of this approach, but there are undoubtedly thousands more which can be accessed after only a modest amount of snooping around that would surely horrify the censors if they saw them. Or perhaps they have ;-) [Disclaimer: I have no personal knowledge of such sites...]

I was amused to read that Singapore has the "15th largest economy in the world". What he meant to say is that the country has the 15 highest per capita GNP. After all, with only 3.3 million people on this tiny island the economy could hardly be in the same rank as that of countries such as France or Canada. So I thought, "I'll show this guy, I'll look it up on the Web!" After an hour of frustrated searching, I gave up finding something as basic as a listing of GDP by country. Just goes to show; the Web has a ways to go...

All the best from "The Far Far East" and keep up the good work!

Barry and Rosemary Brisco  
Singapore, South East Asia  
[bbrisco@pacific.net.sg](mailto:bbrisco@pacific.net.sg)  
[rbrisco@singnet.com.sg](mailto:rbrisco@singnet.com.sg)  
[www.asiandiver.com](http://www.asiandiver.com)  
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Barry:

Thanks so much for the update. Vito is doing a great job in surveying different countries for Internet access. But there is nothing like a firsthand update from someone who lives there and has to walk the walk every day.

Very pleased we are making the trip to Singapore in good shape. I visited there a couple of times in the seventies when I was a member of Uncle Sam's Canoe Club. I recall it as a very clean and pretty city — but a bit over-regulated even then.

Warmest Regards;

Jack Rickard



## INTERNET SERVICE PROVIDER CONVENTION ANNOUNCED — ISPCON '97

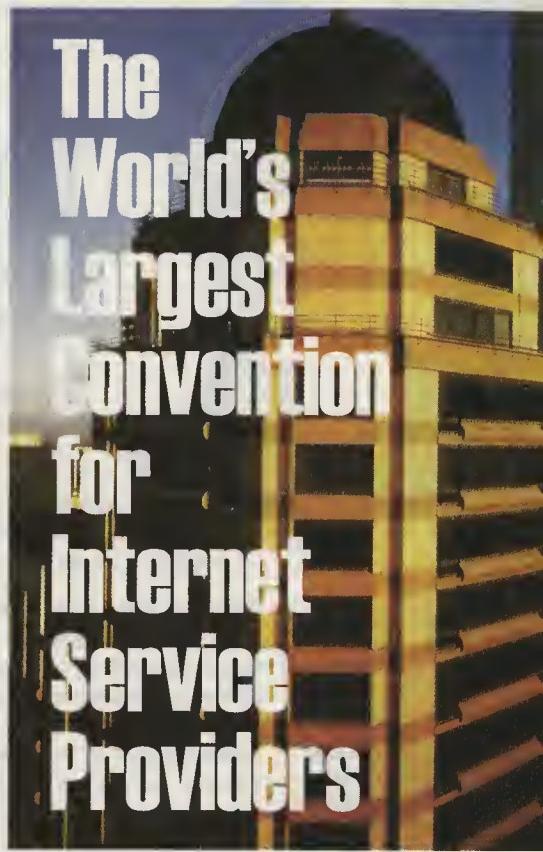
**Boardwatch Magazine** and ONE, Inc. have announced the 1997 Internet Service Provider Convention — ISPCON, to be held August 20-23rd, 1997 at the San Francisco Hilton and Towers in downtown San Francisco, California.

The group hosted ISPCON '96 in San Francisco to a total of 3,046 attendees including 946 Internet Service Providers and 104 vendor exhibits. It was the largest gathering of Internet Service Providers ever held with ISPs from 42 countries attending the event.

With the number of Internet Service Providers doubling in the past year to over 3,640 in the United States and Canada alone, the group expects an even larger event this year with some 1,700-1,900 active Internet Service Providers expected to attend the 1997 event and a total attendance in excess of 4,000.

One of the most oft cited criticisms of the 1996 event was the separation of vendor exhibits in the Moscone Center — nearly four blocks from the San Francisco Hilton. The 1997 event will be held entirely in the San Francisco Hilton with vendor exhibits occupying 41,000 square feet in the hotel ballrooms.

The group has issued its annual call for papers from those in the industry who would like to present topics as part of the educational session schedule. ISPCON typically sports over 120 sessions in two and a half days with as many as 10 seminars in session concurrently. "We're looking for in-depth presentations on emerging access technologies, technical operations, and business and marketing presentations ISPs can use to help develop their businesses," said Jack Rickard, President of ONE, Inc. "The usual 'Internet is Cool' presentation with a screen demonstration of some web site, seen at most trade shows, doesn't cut it with these people. They do think it's cool. They just don't need to go to San Francisco for that." ♦



PROSPECTIVE SPEAKERS should forward a synopsis of the proposed session, along with a biographical paragraph, full speaker contact information, and a photo suitable for publication to ISPCON SESSIONS, ONE, Inc., 8500 West Bowles Ave., Suite 210, Littleton, CO 80123. Session proposals should be received by 1 May, 1997 for consideration.

VENDORS interested in exhibiting at ISPCON '97 can call Bob Holley, Manager Exhibit Sales, at 800-933-6038.

REGISTRATION for ISPCON '97 is priced at \$595. Early registration discounts available on the following schedule:

On or before

April 1, 1997	\$259
May 1, 1997	\$295
June 1, 1997	\$350
July 1, 1997	\$425
Aug 1, 1997	\$495
Aug 20, 1997	\$595

ATTENDEES can register electronically at <http://www.ispcon.com>.



# TECHNOLOGY FRONT

by Jim Thompson  
Western News Service

## THE INTERNET CONTENT PROVIDER WARS - CAN YOU BEAT THE COMPETITION?

For those providing content on the Internet, the high flying days when any idea that even had the word Internet in it was a sure-fire success have come to an end. This is not to say that money, and perhaps even fortunes, will not be made on the Internet.

But it is clear that a good idea and a couple of hot-shot programmers are no longer enough to attract investors willing to open their hearts and their pocketbooks. Making money as a content provider on the Internet in the future is going to take planning, a reassessment of the possibilities and potentials of the net and some good old fashioned hard work.

### DAY OF RECKONING

It doesn't take a rocket scientist to realize that competition for attention on the Internet is accelerating at an alarming pace - and this is just the beginning! Everyday it becomes easier, not harder for one to set up a service on the Internet. If Jack Rickard has things right, ISPs will make setting up a Web site even easier and cheaper in the future. What it means is that if you are not ready to face the competition, you may soon not be in business.

### FOLLOW THE MONEY

The first thing to understand as a content provider is that your customers are made up of users who have no loyalty at all. They will jump ship and stop coming back to your site the minute they see something better. Hey, life is too short to waste any of it poking around a Web site that's boring or doesn't offer anything that is of value.

The next thing to understand is that it is getting more difficult to attract advertisers and other streams of revenue. While advertising dollars may increase overall for Internet content providers, industry analysts agree that there are not enough companies interested in online advertising to support the avalanche of Web sites that are looking to advertisers for their revenue. A single company only wants and needs so many banner ads on Web pages. Unless you have something to offer that is better than the rest of the pack, you won't be able to attract those ad dollars. Advertisers are also becoming much more sophisticated when it comes to their understanding and tolerance of the Internet. The "sizzle factor" is beginning to fizzle as companies demand more than just a "presence on the Web" for their money.

Another reason that ad dollars are only trickling in is that the basics, such as standard sizes for banner ads, placement of the ads on a page and what type of ads do best, have still not been agreed upon. Audit firms differ on just how much advertising money is available but by all accounts it is far from its full potential. For the third quarter of 1996, the amount of advertising dollars was somewhere between \$34 million and \$66 million, depending on which audit firm you believe. This may sound like a lot, but it's chump change compared to the \$133 billion spent on conventional print advertising in 1995.

The high flying Internet IPO (Initial Public Offering) market is also becoming a tougher place to find money than during the glory days of 1995 and 1996. It is becoming tougher to float an IPO and even more difficult to attract investors. Investors are a lot more savvy now than they were a few years ago, and they are demanding more than just a promise. There are also a lot of companies who have been burning up the money they raised with their IPOs. I expect that we will see many companies, which rose quickly in '95 and '96, crash and burn in the coming years as the reality that there is not an unlimited stream of money available begins to set in.

So what is the answer? Where are we going and what is the best position to be in for the future?

The answer to these questions are as diverse as the people asking them. There are no easy or correct answers for everyone in every situation. However, there are some general principals that apply here.

### ENTER THE PUBLISHER

The first thing to remember and understand is that if you are operating a Web site or Internet information service is that you are NOT in the computer business. Sure, computers are part of your business, but your real profession is that of publisher. Forget about having the best software and the newest gadget. Sure, to a certain extent these things are necessary, but this is not the key. The essential element here is the message — information is king. If you want your Web site to be among those that survive into the next century, you will have to start seeing yourself as a publisher. This means running your site like a news publication by combining interesting design elements with accurate information that is engaging, absorbing, entertaining and timely.

Continued on page 35

: - )

**:-)** ISP buys a network access server.

**:-|** ISP finds NAS not all

**:-O** ISP's customers don't always get fast,

**:-(|** ISP can't promise users stability

**(:-<** ISP pulls all the hair out of his head.

**:-D** ISP hears about Shiva's award-winning

**;-)** ISP gets Shiva, grows hair back and

<http://www.>

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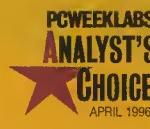
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Just look at the list of the top sites and the picture should be clear. More than half of all the money made on the Web on advertising in 1995 fell into the hands of only 25 companies. Of these 25 companies, five were search engines (*Infoseek*, *Lycos*, *Yahoo*, *Excite* and *WebCrawler*) and 15 were news organizations that made their mark in other mediums. This news services include *CNet: The Computer Network* ([www.cnet.com](http://www.cnet.com)), *ZD Net* ([www.zdnet.com](http://www.zdnet.com)), *HotWired* ([www.hotwired.com](http://www.hotwired.com)), *The Wall Street Journal* ([www.wsj.com](http://www.wsj.com)), *Discovery Channel Online* ([www.discovery.com](http://www.discovery.com)), *PC World* ([www.pcworld.com](http://www.pcworld.com)), *Playboy* ([www.playboy.com](http://www.playboy.com)) and *The San Jose Mercury Newspaper* ([www.sjmercury.com](http://www.sjmercury.com)).

It is no accident the most popular sites are run by news services. Most have been in the business of providing information for many years. They know what the public wants and how to deliver it. Frankly, most of the Web sites I see are complete junk. The majority are visually stale with no direction or form. Just because things jump around the screen or you have the howling of the hounds of hell from an old horror film sound track doesn't mean that the site is worth visiting more than once. I am sure some computer geek thinks all the fancy gadgets are "cool" but that is no longer enough if you want to compete in this business.

If you hope to be around in the future, you will have to offer real service coupled with some genuinely useful information. Keep reminding yourself that you are a publisher and no longer a "computer guy." Think! Think about what you can offer that is unique, useful or needed, then get a plan and put it to work.

Someone once said that it takes only three words to write the perfect newspaper headline. If you could get all these words into the headline, it would certainly command attention from everyone. Those three words are, "Free," "Sex" and "Money." I am certainly not recommending that you give away or exploit any of these, but it is one more indication that you must do what is necessary to attract an audience — a task that is not easy.

Another thing to remember is that we are all impatient. We want information and we want it now. No one wants to wait for what seems like forever for a photo to download just so they can view your home page. The World Wide Web gained rapid popularity because of the ability to deliver stunning graphics.

However, just because you have some great graphics, this is no reason to use them. Remember that the Web is a mire of slowdowns, stalls and waits. Instead of complaining about it or pointing the finger at someone else, why not recognize the problem and try to work around it.

Cut the fat from those graphics and make your site easy to access. Besides reducing the size of the graphic, there are other ways of doing this. One is to reduce the number of colors. I converted a 24-bit color image to 256 colors with no change to the size of the image. The original image was 8.5 MB, the new images was only 2.7 MB - a savings of nearly 6 MB. A 640x480 bitmap was 737 KB at 24-bit color but only 246 KB at 256-colors. You can save even more by compressing images using JPEG. The 737 KB bitmap compresses (at medium quality in PhotoShop or about 40% compression) to only 33 KB.

The bottom line is that you are going to have to do some thinking along with some honest, hard work. This means creating your own site and not just stealing ideas, graphics and information from someone else.

#### COPYRIGHT LAWS

In case you missed it, an international copyright treaty for the digital age was adopted in Geneva in December 1996. Among other things, the treaty, hammered out during a 160-nation, three-week session under the direction of the United Nation's World Intellectual Property Organization, provides protection against software piracy. A second treaty provides worldwide copyright rules covering musical recordings. At the same time, a third treaty that would extend copyright protection to databases on the Internet was proposed. This treaty was not adopted at the time this article was written, but it was clear that approval was near. I would not be surprised if it is passed by the time this article is published.

Under the law, you can be prosecuted for the theft of intellectual property. Copyright protections that have applied to written or recorded works now apply to versions of such works that are distributed electronically over computer networks. This means that as a Web site operator, you will be held to the same standards as those that apply to journalists and news organizations. The days are gone when you can just surf the net, pick up all kinds of cool stuff then

post it on your own Web site. I have always called that theft — now it may be punishable under copyright laws.

#### HONESTY, INTEGRITY SPELL SUCCESS

I also believe this honesty will have to extend to reports reflecting the number of "hits" on a web site. Again, advertisers are becoming a lot more sophisticated. They simply will not buy the inflated, made-up numbers that some unethical web masters try to pass off as a legitimate accounting of usage. I am not saying that everyone engages in such practices. In fact, I am sure it is only a minority. But it does happen and this gives all of us a bad name.

The Internet still offers a great deal of promise for the entrepreneur, but you must be prepared for a lot of changes over the next few years. The first thing to do is take a good, hard and critical look at your own site. The most popular Web sites all have the following in common:

- They offer fresh content that changes daily.
- They are easy to navigate and pleasing to the eye.
- They offer lots of things for free.

If you combine these elements with the old fashioned values of honesty, integrity, sincerity, service and value, then success and a prosperous future are virtually guaranteed. ♦

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## WOW! AND MASSEY NO LONGER IN THE COMPUVERSE FAMILY

After three consecutive quarters of increasing losses, the inevitable has happened at CompuServe. The CEO has resigned and WOW! is no more.

President and CEO Robert Massey resigned on February 17 ending his 20-plus year stint at the company. He had been president and CEO since June 1995. Massey's duties were assumed by Frank Salizzoni, president and CEO of H&R Block, which owns 80% of CompuServe.

Massey said that the company no longer needed his guidance since the transitions he had initiated were in place. There is also speculation that CompuServe may split up into a consumer service and a network service.

WOW! was introduced last year as a family-oriented online service, but was unprofitable. CompuServe attributed their losses to increased competition due to flat-fee pricing by most large and small ISPs.

## TELEPORT USA UNVEILS ALL-IN-ONE INTERNET PHONE LINK

Consumers now have a simple solution for taking advantage of Internet based telephone service using a simple box called the Internet Phone Link by Telepoint. It is a small, easy-to-install desktop device. PC users must have a configured sound card and Mac users can simply use the audio plugs. Full duplex is preferred, but half duplex is supported.



Perhaps the key virtue of the device is its patented noise suppression circuitry. It dramatically improves the quality of the Internet call at both ends, even though the device is not required at both ends.

The Phone Link supports most Internet telephony software and allows users a regular touch-tone or wireless phones instead of microphones and speakers. The list price is \$59.95 (U.S) and comes with a 30-day guarantee and a 2 year limited warranty. It can be ordered directly by calling 800-250-5200 or through Telepoint's web site at <http://www.TelepointUSA.com>

## ZYXEL TO INCORPORATE ROCKWELL'S K56Plus

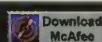
ZyXEL will use Rockwell's K56Plus technology in their new line of fast modems which will be out this summer. Current owners of ZyXEL Elite or Omni modems will be entitled to a free upgrade to 56 Kbps by simply downloading the new firmware.

ZyXEL chose Rockwell's technology because of Rockwell's market share among ISPs and their efforts in establishing international standards for 56K communications.

Their URL is <http://www.zyxel.com>

## MCAFEE TO DELIVER SOFTWARE UPDATES VIA PUSH TECHNOLOGY

**MCAFEE** Network Security & Management



McAfee and BackWeb Technologies have begun beta testing SecureCast, a push technology that will deliver regular updates for its family of anti-virus software. Updates will be automatically downloaded in the background via the user's web browser.

Customers can subscribe to this service by visiting McAfee's web site and downloading the BackWeb client. Customers can then specify how frequently they wish to receive anti-virus updates. SecureCast performs such updates when the user is connected to the web but not downloading any data. This service is free to any McAfee VirusScan customer.

McAfee has also acquired Jade KK, a leading Japanese anti-virus software developer.

In addition to working with McAfee, BackWeb provides platform independent software for companies to create their own broadcast channels. Currently, over 30 companies are using BackWeb's technology.

The McAfee URL is <http://www.mcafee.com>. The BackWeb URL is <http://www.backweb.com>.

## AFFILIATED INTERNET COMPUTERS OFFERS USED GEAR ONLINE - CONFIGURED AND GUARANTEED

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ISPs and wannabe ISPs can now buy refurbished equipment online. Affiliated Internet Computers (AIC) has millions of dollars worth of used servers, routers and peripherals for sale on their web site. They specialize in Sun Micro-systems and DEC Alpha servers and Cisco routers. Items are guaranteed for 90 days and some even qualify for manufacturer maintenance.

AIC also offers a free locator service. ISPs looking for equipment can submit their request and AIC will do the rest. AIC offers a unique, out of the box solution for ISPs who need to expand quickly or for individuals who are setting up shop.

Their URL is <http://www.internethardware.com>.

## UUNET PLANS \$300 MILLION BACKBONE EXPANSION

UUNET Technologies Inc., a subsidiary of WorldCom Inc., will spend about US\$300 million in 1997 on an expansion and upgrade program that will more than quadruple the available capacity across its national network in terms of both backbone bandwidth and dial capacity. The company said February 19

that traffic over the backbone is nearly doubling every quarter and demand for dial access is growing at more than 10 percent every week, so it has initiated the most ambitious network expansion plan in its 10-year history.

Over the next six months, UUNET will begin upgrading its backbone in segments to support the highest speed available today for IP (Internet Protocol) transmission: OC-12 (622 million bits per second). This will involve shifting of the backbone links to the Asynchronous Transfer Mode (ATM) protocol. ATM is the only proven technology currently available that supports IP transmission at OC-12 speeds. The company will install ASX-200 and ASX-1000 ForeRunner™ ATM switches from FORE Systems, Pittsburgh, PA.

To increase the number of dial access ports, the most common means of accessing the Internet, the company will install new generation, high-density MAX TNT remote access concentrators from Ascend Communications, Alameda, CA. The MAX TNT concentrators, which support both analog and digital dial-up traffic, will be deployed throughout the U.S., Canada, and Puerto Rico. The expansion represents a more than quadrupling of UUNET's dial access infrastructure.

"In terms of schedule, scope and implementation of advanced technology, what we are doing in our network is absolutely unprecedented — for us or any other ISP," said John Sidgmore, president and CEO of UUNET, and chief operations officer of WorldCom. "The pace of growth in the Internet underscores the importance of ISPs being facilities-based. The recent merger with WorldCom gives UUNET the ability to secure and control the bandwidth necessary to meet our customers' requirements for high-performance service."

UUNET currently has about 50,000 business customers worldwide, and over 600 high-speed customer connections are added to the network every month. UUNET is also the only ISP with local access in all 50 states, plus the District of Columbia and Puerto Rico. UUNET provides Internet access to the Microsoft Network™, and supports GTE, EarthLink Networks, WebTV Networks, Inc. and several other ISPs and on-line service providers.

Founded in 1987 and headquartered in Fairfax, Va., UUNET Technologies, Inc. is one of the three largest Internet backbone operators. The company's network is comprised of POPs throughout the United States and in Canada, Europe and the Asia-Pacific region, as well as connections to Internet service providers around the world. UUNET's World Wide Web address is <http://www.uinet.com>. WorldCom, of Jackson, Miss., is a global business telecommunications company operating in more than 50 countries. WorldCom's World Wide Web address is <http://www.wcom.com>.

#### REALVIDEO AVAILABLE FOR PUBLIC BETA



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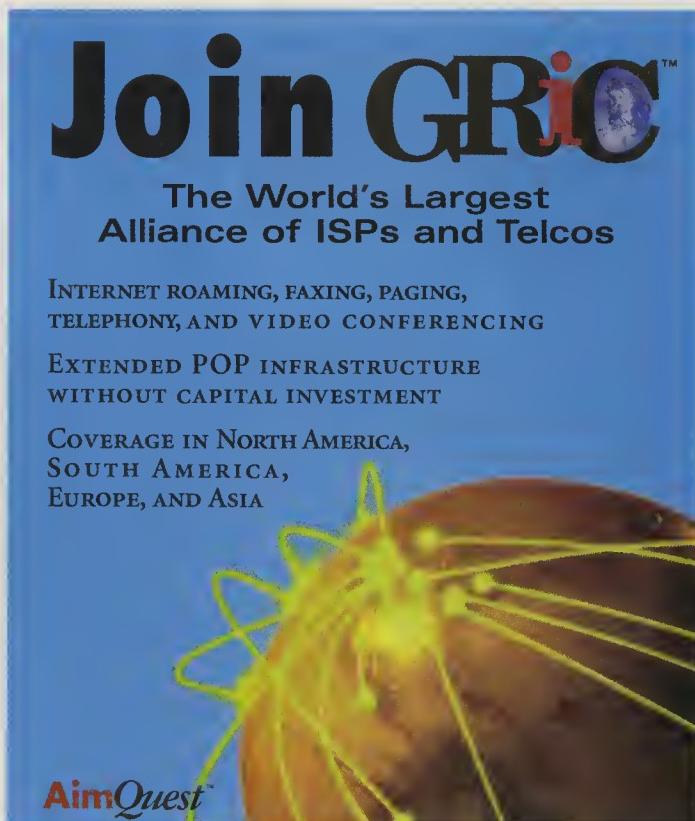
ering video over the Internet, on February 10. The beta version of RealVideo is available at [www.real.com](http://www.real.com) by downloading the free RealPlayer. RealPlayer combines RealAudio with RealVideo, allowing web users to play live and on-demand audio and video.



The Seattle, Wash., company says the product delivers "news-cast-quality" video over 28.8 kbps modems, "full-motion-quality" video over V.56 (56 kbps) and ISDN (64/128 kbps) modems, and "near-TV broadcast quality" video at LAN rates or broadband speeds (100 kbps and above). On the client-side, RealVideo offers interactive features, such as video seeking and scanning, clickable video regions, and buffered play for better video quality using slower 28.8 kbps modems. On the server side, the company says, the software allows webcasting companies to deploy from several hundred to several thousand simultaneous video streams. RealVideo works on several platforms on the client side, including Windows, Macintosh, UNIX, Web TV and other web-enabled devices. On corporate servers, RealVideo runs on Windows NT, and several UNIX platforms.

Several content companies also announced plans to adapt their TV programming for the Internet using RealVideo. C-SPAN announced that it will use RealVideo to broadcast more than 10 hours of live programming every day on the web. The Fox News Channel plans to use RealVideo to broadcast its cable news channel 24 hours a day for two weeks and selected programming later. ABC announced plans to cover the eight-weeks of Oscar hoopla, leading up to the March awards ceremony using RealVideo. And MGM announced plans to launch up to four video programs on the web, the first one called "True Crime Stories."

Netscape Cofounder Marc Andreessen will keynote Progressive Networks' RealMedia Conference, March 3-4 at the San Francisco Airport Hyatt. This conference is intended to teach developers, content creators, and media companies how to use RealVideo to deliver compelling audio and video over the web. For details, call 1-800-765-3705 or visit Progressive Networks' web site at [www.real.com](http://www.real.com).



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## BAY'S CONCENTRATOR MODULES SUPPORT 2,300 DIGITAL MODEMS IN EIGHT-FOOT CABINET

Remote access concentrator modules that support more than 2,300 simultaneous dial-in analog and digital modems in a standard eight-foot cabinet will be available from Bay Networks Inc. in May.

Designed for the Bay Networks 5000 Multi-Service Access Switch (MSX), the new high-performance Model 5399 Remote Access Concentrator Module features dial access density, security, call management and BayDSP' integrated Digital Signal Processing (DSP) modem technology at a port price of US \$416 for network service providers requiring a high-density access platform. The Model 5399 plugs into Bay's 5000 MSX Switch. The switch holds four modules, and four switches can be stacked in the standard eight-foot cabinet used by ISPs and corporations with numerous dial-up ports.

The Santa Clara, Calif., company's module offers a quadruple density increase for the System 5000 MSX, which combines dial access, routing, switching and shared media access in an integrated system. The Model 5399 Remote Access Concentrator Module is priced at US\$19,995 for two PRIs and 48 DSP modems.

The modular design of Bay Networks' carrier-class remote access concentrator allows flexible configurations and consolidates all remote access traffic from dial-in analog and ISDN ports as well as industry-standard WAN and remote connection types onto a single, integrated module. The product provides two PRIs or Channelized T1/E1 lines with support for up to 48 industry-standard V.34 33.6 kbps digital modems for North American networks or 62 modems for international networks with built-in redundancy. Up to 576 digital modems can

be configured in a single 5000 MSX chassis and 2,304 digital modems per standard eight foot carrier-class cabinet for North America. Up to 744 digital modems per 5000 MSX chassis are supported for international networks. Each module also offers high dial access performance with three 32-bit CPUs, and up to 36 CPUs per 5000 MSX chassis.

The new remote access module is based on the DSP modem technology that became available to Bay Networks when it purchased the DSP modem business of Penril Datability Networks. Jonathan Sieg, general manager of Bay Networks' Signal Processing Group said the BayDSP modem platform supports the pending release of "Smart56" — Bay Networks' software upgrade to the 56 Kbps technology being developed by Rockwell and Lucent.

To provide a secure dial-up connection, Bay's Model 5399 offers security features that include: automatic dial-back, multi-level password protection, user authentication, audit trails, PPP PAP and CHAP security, Windows NT Domain security, and support for third party authentication applications — plus support of industry-standard RADIUS authentication, authorization and accounting. In addition, the module is manageable by Bay Networks' Optivity-Services' network management application which allows management of all network devices under a common management platform.

Bay Networks, Inc. offers LAN and ATM switches, hubs, routers, remote and Internet access solutions, and network management applications. With revenue of \$2.1 billion in its most recent fiscal year, Bay Networks offers 7x24 technical support worldwide. Bay Networks' World Wide Web address is: <http://www.baynetworks.com>. The company can be reached by voice at (408) 988-2400.

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## BELL LABS USES ULTRA-FAST LASER TO TRANSMIT DATA

Scientists at Lucent Technologies' Bell Labs have found a way to launch lightwave data at more than 7GB per second over a single optical fiber using a single laser. The technology which was patented in mid-February uses a single laser to generate light pulses each lasting just 100 millionths of a billionth of a second. The researchers have transmitted data, in the ones and zeros of digital information, over 206 wavelengths, or colors, of light. This is the largest number of communications channels ever generated over a single fiber.

The researchers used a technique called wavelength-division multiplexing (WDM), the transmission of data over multiple wavelengths. Each wavelength adds a transmission lane to the information superhighway; the more lanes there are, the more traffic that can be carried on a single fiber, whether it's voice, data, or video.

Instead of following the conventional technique of stringing together a series of single-frequency lasers to launch multi-wavelength lightwave signals for WDM transmission systems, the scientists made innovative use of a femtosecond laser transmitter, a spectrally broadband source that covers a multitude of channels, and a new kind of data-encoding scheme.

Each wavelength arrives at the end of a fiber at a slightly different time so that the data can then be encoded sequentially onto the WDM channels using a single data modulator. The technique requires an extremely broad color spectrum and a short optical pulselength, both characteristic of a femtosecond laser. The shorter the light pulse, the wider the color spectrum; the wider the spectrum, the more channels that can be generated.

While a single ultrafast light source can generate hundreds of communications channels, conventional WDM systems are

usually limited to dozens because the task of combining and stabilizing a large number of single-frequency lasers becomes increasingly complex and expensive.

The femtosecond light source is a modelocked, or pulsed, laser made of a length of optical fiber containing the rare-earth element erbium. Each color, or channel, in the experimental system carries 36.7 million bits of information per second. This would indicate a data transmission speed of 7.5 GB per second over a single piece of optical fiber.

Bell Labs researchers Martin Nuss, Wayne Knox, Luc Boivin and Steve Cundiff, of the Advanced Photonics Research department in Holmdel, N.J., and Stark, of the Optical Physics Research department in Murray Hill, N.J., built the 206-channel WDM transmitter.

A patent has been granted to Knox and Nuss, who invented the "chirped-pulse" multiwavelength telecommunications system. Two technical papers describing the new technology were presented by Boivin and Cundiff at the international Optical Fiber Communications Conference on February 19 and 20, 1997 in Dallas.

Bell Labs is the research and development arm of Lucent Technologies, which designs, builds and sells a wide range of public and private networks, communications systems and software, consumer and business telephone systems and microelectronics components.

Lucent Technologies was formed as a result of AT&T's restructuring and separated from AT&T. More information may be obtained from the Lucent Technologies website, <http://www.lucent.com>. ♦

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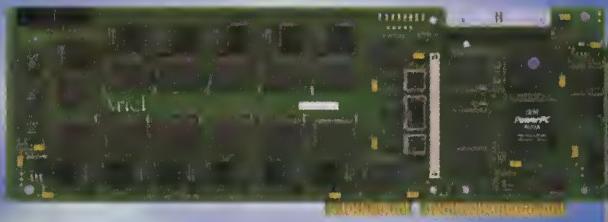
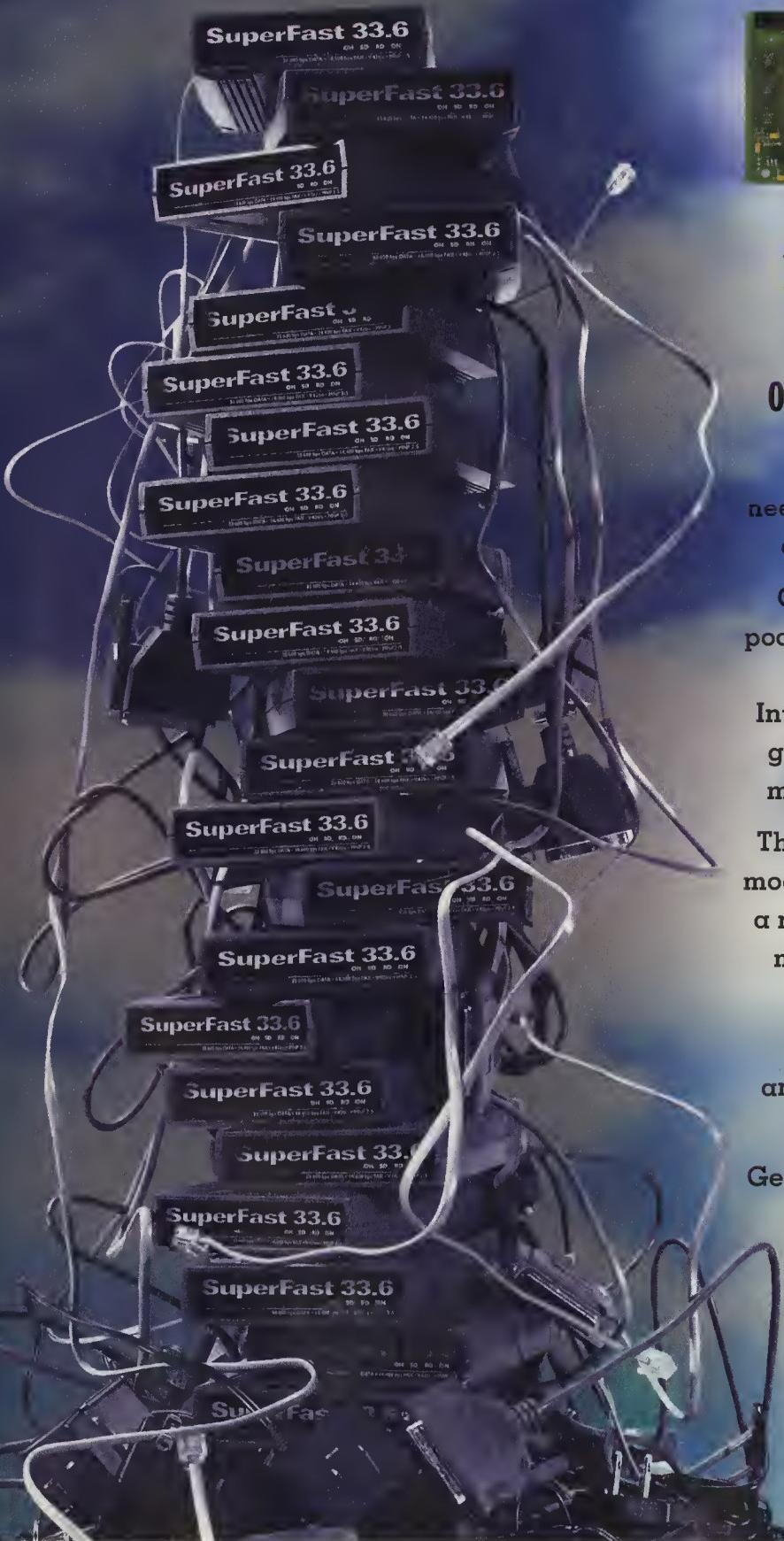
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# LINUX REDUX

by Alan Cox

## BUILDING AN EFFECTIVE LINUX SERVER

**G**iven enough money anyone can build a reasonably fast machine. With the right choices, however, you can often build a faster machine for far less. In this article I want to focus on building effective Linux servers for some common Internet applications, and what to weigh up when building the system. I've almost always avoided mentioning vendors and products by name. For one thing, if you ask any newsgroup, you will always find people who swear by, and people who swear at, any given product.

### FIRST I NEED A REALLY FAST PROCESSOR?

Probably not. Most computers are actually I/O bound. That is to say that the processor is spending time idle waiting for other operations to complete. A faster processor serves only to impress your friends and increase the amount of time waiting for I/O operations. Certain applications do need fast processors without a doubt. Many scientific and engineering simulations eat hours of computer time. With jobs like these a fast processor, is needless to say, a huge win. For a typical PC running as a Linux news server it can easily hit 80% of its time stuck waiting for I/O — that is to say the processor could run at 1/5th of the speed and nobody would really notice the difference.

Fast processors are also expensive. Thus we want to pick other devices to offload some of the computing work onto controllers and to boost the I/O performance to minimize the CPU time wasted.

### DISK CONTROLLERS

The most obvious I/O devices for a server are the disks. For many server, they are also probably the most critical resources.

Machine Description	Disk Performance	Large Source Tree Compile Time
486DX-33 16Mb cheap IDE disk	1.4MB/second	11:22
486DX-33 16Mb PCI SCSI	3.5MB/second	8:41
Dual P90 24Mb cheap IDE disk	1.3MB/second	10:31
Dual P90 24Mb PCI SCSI	3.7MB/second	7:55
Dual P90 24Mb PCI SCSI (md)	5.8MB/second	6:21

It's immediately apparent from this table that, with a cheap IDE disk, the Pentium machine was slower than a 486 with a good busmastering PCI SCSI controller. Equally apparent is that the last entry, which is the P90 using a pair of striped disks, is measurably faster than the single disk. In fact even with the dual disk array the dual Pentium 90 box was 10-20% idle

throughout the compilation. Note that the IDE controllers in the test are both traditional IDE controllers not the fast triton DMA driven controllers.

Several things govern disk performance. Firstly the disk controller itself. Disk controllers can be so dumb that the processor must issue each request to in turn and copy the data, and smart enough that the controller receives streams of commands, sorts requests, and copies data itself. Good SCSI disk controllers will have bus mastering DMA facilities and also support the ability of SCSI to issue multiple commands at once to devices. The former saves you processor time because your machine is running user tasks not sitting idle while it copies bytes from an I/O chip. The latter improves performance markedly.

IDE disk controllers are generally less capable. Only one command may be outstanding at a time, and the processor must copy the data. The newest motherboards with Triton and Triton II chipsets have additional support for higher IDE performance. These IDE controllers can do bus mastering DMA and offer a considerable (sometimes five times) performance increase over normal IDE. The inability to issue more than one command at a time to the devices on the bus applies. Thus it is a good idea if you have two IDE channels to split the disks across the two channels not simply stick them as HD-A and HD-B.

### DISKS

Disks come in assorted shapes, forms, and interfaces. The interface you chose is pretty much decided by the controller. One of the most important performance figures for a disk is the "head data rate." This tells you how fast data comes off the disk itself. Often (especially with IDE disks) all that is quoted is the seek time of the disk and sometimes the "peak data rate," which frequently means the data rate if the data was already in the small cache on the disk itself.

SCSI disk vendors generally quote detailed statistics for their disks including mean time between failure (something not to ignore for a server) and head speeds. With SCSI you also generally get a choice of rotation speeds from the common 3,600 RPM up to 7,200RPM and Seagate's newly announced 10,000RPM disks. The faster rotating disks read data more rapidly. The faster rotation also means that a given block of data will pass under the disk head more often and therefore will be read sooner than on a slower disk.

So we all want high rotation speed disks? Well they have their problems too. For one thing the average

7,200 RPM disk is not something you would choose to stick in your desktop computer. The speed of the disk makes it very noisy. The extra speed makes it run far hotter. You may well need large cases and additional ventilation fans to run these disks within specification. For a news server, however, they are well worth the pain.

Never forget that disks fail. Your wonder server has to have been planned to allow for disk failure. That implies both a back-up device (which I will discuss later) and also some kind of recovery strategy. Perhaps if the server must be backed up rapidly, then keep a spare disk handy, or even a clone machine. Price generally dictates the choice. For a high reliability system you can get SCSI controllers or SCSI disk units that implement RAID, which is a set of standards for multiple disk arrays. This includes mirroring, striping and also some clever techniques for spreading data across the disks. The most common high reliability option used with these kinds of controllers is RAID5. A RAID5 array has a spare disk that the controller will automatically switch to in the event of a failure, and the ability to lose one of the running sets of disks. Thus a disk failure isn't even down time. With a good RAID setup, you can pull out faulty disks and replace them with new disks without even unmounting the file systems. It doesn't take much to see why large critical servers use RAID arrays. However for many applications, the cost of a RAID array is prohibitive.

## SOFTWARE HELP FOR DISK I/O

Linux 2.0 has a software "meta-disk" driver. This can perform one of the very basic RAID facilities (RAID-0), which is disk striping. On a striped disk, groups of disk blocks ("chunks") are written alternately across multiple physical disks. This means that when reading and writing, each physical disk is doing half the work, and disk performance, while not doubling, normally goes up 70-80% over a single disk. The final disk controller benchmark given earlier was done with a pair of identical disks using the meta-disk driver as a single file system for extra speed.

## MEMORY

A good machine needs plenty of memory. It needs enough that its "working set" of programs rarely needs to swap things to disk. When the working set exceeds the amount of memory, the machine spends

most of its time copying data to and from disks. By memory standards, disks are incredibly slow devices and performance comes crashing down. Starting X Windows on a 4MB machine will give you a fine example of this behavior.

Adding more memory than the working set needs does not materially reduce the rate of swapping. Instead it provides much needed cache for commonly used disk data. A large disk cache covers a multitude of I/O sins and, since it's practically impossible to get a disk subsystem that is fast enough for a big news server, that is one application where there is a lot to be hidden. Both mail and web servers benefit materially from plenty of memory to use as a disk cache. In both cases, a lot of disk I/O is saved because the same things are generally referenced repeatedly — the home page for example.

## CACHE MEMORY

In the same way that our disks cannot keep up with our memory, our memory cannot keep up too well with the processors. For a PC system, it is normally a choice of 256K or 512K cache. The more memory, the more cache memory is appropriate. One place where the amount of cache memory is very important is dual or quad Pentium Pro machines. Here, somewhere between two and four processors are sharing memory that, at times, isn't fast enough to keep up with a single processor writing flat out. With such machines, the more cache you can get the better. Since the second level cache comes on the chip, this limits you to a choice of 256K or 512K. Most of the Pentium dual processor boards have a single second level cache shared between both processors. For almost every application a single PentiumPro is faster than a dual Pentium.

When you buy a motherboard, also check how much memory can be cached. Triton and the cheapest Triton II based motherboards can only cache 64MB of main memory. If you add more than that, Linux will slow down a lot and you will end up buying a new mainboard. Apart from the cheap boards most other boards will cache around 512MB of memory, which ought to be enough for anyone.

## BACKUP DEVICES

Backups are both the most critical and, at times, the most machine demanding application. When doing a backup, a

server is reading every byte of every file on its disks and writing them out to another device. Backups generate vast amounts of I/O load and it is often best to schedule them carefully to run in the quietest times. On a news server it may well be worth throttling it (see man *ctlinnd*) which stops it from receiving new articles until the backup is done. Certainly try to avoid doing a backup while the news server is doing an expire. The news server's article expiry process scans hundreds of thousands of articles, each in a file, and deletes all of those that have past their expiry date. Short of a backup, there is little else that generates so much I/O traffic on a machine.

For small machines, there are a wide variety of choices for backup devices and media from floppy tapes, which are cheap but tend to be fairly low capacity and speed, through the QIC-02 tape units, and up to SCSI devices. On a large server a SCSI DAT drive is about the only choice. DAT drives typically store 2 to 8GB of data on each tape and can archive at quite acceptable speeds.

Another option is to centralize the backups and use the ability of tools like Tar to dump to remote machines, or to backup machines over NFS. A wide variety of commercial backup tools can also perform network backups. By centralizing the backups, it makes the management far easier and also avoids the cost of a backup unit per machine.

## VIDEO CARD

A good video card makes all the difference on a desktop machine. I've put it firmly at the bottom of this article on the basis a typical server isn't used to play games. If you are regularly running graphical applications on your server, then it is worth picking up at least a cheap S3, Cirrus, or similar low end card. While these boards cannot do things like 3D hardware rendering, they can draw lines, copy blocks of data, and do scrolling without the processor copying screen memory around.

Also ask yourselves if the server needs to be used for displaying graphics. The X Window system allows you to run graphical administration tools remotely and this may be a better choice. At work, I frequently have Windows running graphical tools on four or five machines at once. I've even been known to play Xtetris on a web server by mistake.

## EXTERNAL ENVIRONMENT

Most servers need to be reliable. Adding devices like hardware watchdogs can help ensure machines come back if there is a crash or a small power glitch. A UPS will help protect against power brownouts and surges but, at the end of the

day, you also need good components in the server.

Unlike a desktop machine it isn't wise to overclock a server, or to skip details like processor fans when recommended. At home it's annoying if the one in a thousand overheat occurs, on a web server for a whole organization, it will generate telephone calls, get people out of bed, and produce piles of paperwork and meetings that most people would prefer to avoid. Test the server before deploying it — run it in a fridge and next to a radiator, if necessary, to test it at the full range of temperatures to which it may be exposed.

you've still got any doubts, then take a peek at sites like <http://www.dejanews.com>. DejaNews runs on dual Pentium 133 boxes running Linux/SMP.

Having talked about building solid hardware this issue, the next article will deal with the software and extra hardware needed to turn Linux into an effective terminal sever, and I hope in a few articles time we will have covered enough of the other software to let anyone build a Linux based Internet service provider.

I don't seem to have much space left to cover something fun as an end piece. Those folks who like squashing our beloved Bill will be delighted to know that Xbill 2.0 has been released and can be found at <ftp.x.org> in /contrib/games. For those not in the know, this is the game where you get to frantically try and splat hordes of Bill clones, who are trying to infect your computers with Windows. Very silly, very simple and very good fun. ♦

## CONCLUSION

For an Internet server that is supposed to stay up and stay running, pick the right components for both performance and reliability. Assume the entire world is out to get you and consider uninterruptible power supplies and watchdog cards.

You can definitely run a heavily hit and large scale site with Linux boxes. If

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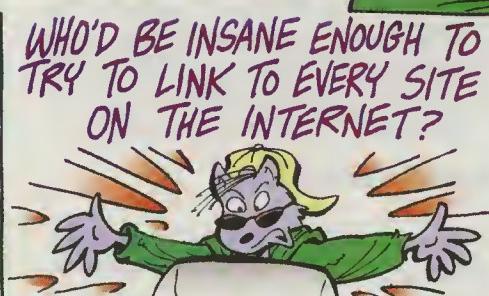
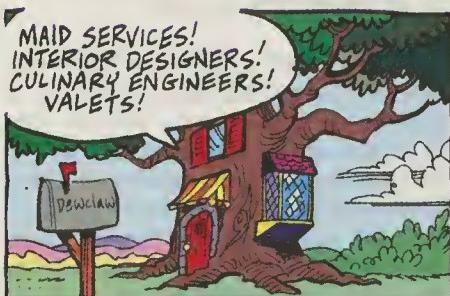
# REVIEW & KELL

by  
Bill Holbrook

E mail: 76711.2174@compuserve.com

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# CONSUMMATE WINSOCK APPS

by Forrest  
Stroud

## HINTS FOR PICKING THE BEST INTERNET PROVIDER

Thanks to the nearly universal pricing plan now offered by Internet Providers (unlimited Internet access for a fixed monthly fee ranging from 15 to 25 dollars), most people now select the first provider that they come across. While the differences between providers have definitely narrowed, there are still some important factors to consider before making your choice:

**Accessibility:** This is the single-most important factor for those who want to connect to the net regardless of location (within the U.S.) without having to pay long-distance fees. While some providers will offer an 800 number for this purpose, using it will still cost far more than a regular local call. Look for a provider with POPs (Points of Presence) located throughout the U.S., especially cities to which you are apt to frequently travel. SPRYnet ([www.sprynet.com](http://www.sprynet.com)) is one of the best providers in terms of accessibility with more than 450 POPs nationwide (and many international ones too).

**Flexibility:** This factor involves the providers' abilities to quickly address network problems as well as their ability to quickly respond to changing environments. For the former, ensure that the provider has multiple backbone connections to the net and automatic system recovery capabilities for when the unexpected occurs. As for the latter, watch how prospective providers handle the 56 Kbps modem issue — whether or not they upgrade, how quickly they upgrade, and how responsive they are to their customers on this issue. This will give you a good idea of how responsive the providers will be with future changes in bandwidth availability. Local providers may have the edge here since they only have to upgrade a single location; on the other hand, national providers benefit from economies of scale and typically have the resources to handle upgrades more efficiently.

**Busy Signals, Web Page Space, and News Groups:** These are commonly the factors most important to the typical person interested in getting on the net. They are also extremely overrated, especially compared to the above two factors. First, busy signals are becoming less common as providers become more common and competition increases. The ratio of busy signals is still important, but not as important as the first two factors nor a provider's type of equipment (ratio of 14.4 Kbps modems to 28.8, for example). Web page space is something that you can find anywhere on the net and is therefore not a factor you should use for picking a provider. And all providers carry a standard list of Usenet newsgroups. Even the most minimal listing carries at least a thousand more groups than you're likely to ever use. Free access to Clari.net

news is a bonus that you can look for, but it's definitely not a critical factor.

Overall, look for a provider that not only meets your current needs but is also flexible and responsive enough to grow with you. And if you have a current provider that doesn't meet your needs now, take the time to look into the alternatives. Switching providers is a quick, nearly painless process that can save you time, money, and a lot of future frustration, especially if you get started early!

The screenshot shows the TextPad application window. At the top, there's a toolbar with icons for file operations like Open, Save, and Print. Below the toolbar is a menu bar with options like File, Edit, View, Insert, Tools, Help, and a Language dropdown. The main workspace is a large text editor area with a dark background and white text. On the right side of the window, there's a sidebar containing product information:

<b>Desc:</b>	A superb Windows text editor that doubles as an ultra-efficient web editor
<b>Pros:</b>	Quick, powerful, and extremely easy to use; impressive set of features (especially the Warm Start option)
<b>Cons:</b>	TextPad excels at maintaining web sites, not creating them; cost relative to HTML Writer
<b>Location:</b>	<a href="http://www.textpad.com/download.html">http://www.textpad.com/download.html</a>
<b>Status:</b>	Shareware - \$27
<b>Company:</b>	Helios Software Solutions
<b>Website:</b>	<a href="http://www.textpad.com">http://www.textpad.com</a>

A vast majority of web masters today are finding that when it comes to maintaining a web site, the HTML editor that served them so well during the initial development of their site just doesn't measure up anymore. The reality is, once you've integrated all the graphics, sound, Java applets, and original content into your web site using a high-power HTML editor like HotDog, HomeSite, or Microsoft FrontPage, you'll likely find that the same features you found so useful in your editor before are now simply overkill. Feature-laden HTML editors tend to take longer to load when being run at first (this especially applies to HotDog), they tend to lack screen real estate due to a large number of toolbars and graphics, and they often make the process of implementing small and routine changes to pages overly laborious. For a web site to be successful, it needs to have a constant infusion of new information and it needs to evolve in response to the viewers' needs and wants. This is where a webmaster really earns his or her money and where the good sites distinguish themselves from the mediocre. As a result, the tools of choice for maintaining web sites should come as no surprise — small and quick text and HTML editors that make the process of revising pages and adding new content as efficient as humanly possible.

The first app introduced to meet the maintenance needs of web masters was surprisingly enough, Windows Notepad. This tiny app met most developers' critical needs — it loaded quickly, it handled multiple pages simultaneously, and it made simple the process of making small changes to web pages. Unfortunately, it lacked many HTML specific features as well as the ability to handle large files (32Kb+ in the 16-bit version). Despite being small and quick, Notepad's shortcomings quickly made revising web pages a major chore. To capitalize on Notepad's deficiencies, a great little freeware HTML editor by the name of HTML Writer was developed. Introduced in 1994, HTML Writer was an instant savior to the first generation of web masters, often cutting in half the time spent on web maintenance. While it did lack many critical features — including a 32-bit engine, long-file name support, a spelling checker, etc. — to many users it was nothing short of a godsend. Many CWSApps users have lamented the lack of progress made on HTML Writer — it's been more than a year since the client was last updated. In that time, the Windows world has dramatically changed and the web has evolved into an entirely different environment. Still, there have been few high-quality yet user-friendly alternatives to HTML Writer introduced on the net. Fortunately, that is finally beginning to change, thanks largely in part to an app named TextPad.

The developers of TextPad, Helios Software Solutions, have put together a package that will satisfy the most demanding editing needs of web masters and non-web masters alike. Available in both 16 and 32-bit versions, TextPad loads quickly, performs very efficiently, and offers an outstanding set of features. Usability is the name of the game in this niche market; it's also the area in which TextPad really excels. Long file name support, the ability to handle large files (up to the limits of your virtual memory in the 32-bit version), huge screen real estate, Multiple Document Interface (MDI) capabilities for working on several documents at once, OLE2 Drag 'n' Drop, multilingual interface functionality, an integrated spelling checker (also available in a number of languages), HTML web viewing (by automatically launching an external browser), unlimited undo/redo capabilities, a customizable toolbar, a keystroke macro recorder, and powerful search and replace abilities (including multiple file replace) are just a few of TextPad's great features. TextPad also offers many configuration options allowing you to customize the client to your needs and, as a result, work in the most efficient manner possible.

Two of TextPad's most unique and impressive features are text bookmarks and the "Warm Start" option. Like physical bookmarks, text bookmarks allow you to save your place in a file (especially useful for long, complex files) and then quickly find it once again at a later time. The "Warm Start" feature complements text bookmarks by allowing you to save your entire work session and then return to it later exactly the way you left it. Using Warm Start, all of the files you were previously working on can be restored to their prior location and window size, thereby saving you the time and effort of having to find where you last left off, open the necessary files, and then jump to the correct locations. These two features exemplify the attention to detail prevalent throughout TextPad and are great examples of how Helios has developed the client from the ground up with the user in mind. While TextPad may not meet all of your needs — especially when it comes to developing web sites from scratch (check out HomeSite, FrontPage, or HotDog for that) — but if you want a quick and powerful editor that can make your life a whole lot easier, TextPad is definitely the app for you. HTML Writer fans, rejoice — a worthy successor to the king of efficient editors has finally arrived.

## ICQ for Windows 95



<b>Desc:</b>	An automated agent that notifies you when your friends get on the net
<b>Pros:</b>	Tons of features, continually scans the net for your friends and acquaintances, minimizes system resources
<b>Cons:</b>	Your friends need to be registered with the ICQ server, requires external apps for some types of communication
<b>Location</b>	<a href="http://www.mirabilis.com/products.html">http://www.mirabilis.com/products.html</a>
<b>Filename:</b>	icqsetup.exe
<b>Status:</b>	Free beta release
<b>Company:</b>	Mirabilis Ltd.
<b>Website:</b>	<a href="http://www.mirabilis.com">http://www.mirabilis.com</a>

ICQ is a revolutionary new program that constantly searches for your friends or associates when they connect to the net. A rather cute play on the words "I Seek You," this free (while in beta release) client will automatically alert you when anyone on your list of contacts gets on the Internet. Your personal people agent then enables you to contact those users who are online if you desire. You can even connect with multiple users and set up an online conference or just travel on the information highway together. You can send messages and files to other users, set up online chat sessions, play games, surf the net together, leave messages for users who aren't currently on the net, and more. ICQ also allows you to utilize external Internet applications for phone and video conferencing through built-in support for clients like Internet Phone, Microsoft NetMeeting, WebPhone, IRISPhone, VDOPhone, CU-SeeMe, CineVideo, Netscape CoolTalk, and more. ICQ will even notify you and automatically update itself when support is added for new external clients. This environmentally friendly app works in the background and uses a minimum of system and Internet resources in its effort to continually monitor for new arrivals.

ICQ saves you the time and energy of having to continually search for your friends on the Internet, only to find that they aren't even connected when you need them. Additional features designed to make life easier for you include FileDirect (a powerful module for transferring files), Message Direct (saves and stores messages for you when you're offline), ChatDirect (a built-in conference chat system), URLDirect (for exchanging web bookmarks with others), firewall support, an online search engine (the ICQ Yellow Pages), support for popular web browsers and e-mail clients, and the use of FileDirect servers (personal file servers that you can set up so others can freely browse and download files). There are countless uses for an app like ICQ. Whether surfing the net with your friends, conducting a business meeting with employees located all around the world, collaborating on a book, or developing a web site with your online partners, ICQ makes it all possible and offers you the ability to do so in more ways than ever before. The only downside is that unless your friends have already registered with the ICQ server, you won't be notified when they connect. So you might want to take my advice — rush out and get all your friends signed up so that you begin taking advantage of this extraordinary client today!

The immense success of PointCast has developers across the world jumping at the opportunity to cash in on what appears

<b>Desc:</b>	A channel-based "push" technology news alternative to PointCast
<b>Pros:</b>	InfoFlashes, software updates, and multimedia news via specialized online news channels
<b>Cons:</b>	PointCast offers roughly the same information but with a better interface and overall design
<b>Location:</b>	<a href="http://www.backweb.com/dl/download.html">http://www.backweb.com/dl/download.html</a>
<b>Status:</b>	Freeware
<b>Company:</b>	BackWeb Technologies
<b>Website:</b>	<a href="http://www.backweb.com/">http://www.backweb.com/</a>

to be a very lucrative niche market. BackWeb Technologies' BackWeb client is the latest entrant to wage war against PointCast. Like PointCast, BackWeb is a channel-based "push" technology client that delivers news in a fashion similar to your basic cable TV — each channel offers specialized content that is broadcast to its subscribers. You pick the channels that interest you and determine how much and how often you want the information delivered. While PointCast specializes in general category channels (sports, stocks, business news, etc.) and newspaper-specific channels (online news from your favorite hard copy newspapers like The Chicago Tribune and The New York Times), BackWeb channels are typically more specific and are often limited to one company or individual service per channel. The difference in focus of the two clients can be compared to that of normal television and cable television. This analogy also helps explain why BackWeb, despite giving up nearly a year's headstart to PointCast, already offers more channels than the current champ. As with cable TV, specialized content allows companies to focus on a specific segment of the population rather than attempting to provide content that meets the diverse needs of the population in general. With specialization there exists greater opportunity for companies to focus on a segment of the population to whom they can offer their services without as great of a threat of competition. This point is reinforced by the current list of content providers that have signed up with BackWeb. Channels are currently available from the likes of iWORLD, Infoseek, McAfee, Sportsline USA, VocalTec, ZDNet, and more than thirty other companies (for an updated list check out <http://www.backweb.com/chan/channels.html>). So far, BackWeb has done a great job of attracting providers, but simply having more channels than PointCast is not going to be enough to pry the eyes of users away from PointCast.

BackWeb attempts to best PointCast by offering a service that is unique yet combines some of PointCast's best features. Like PointCast, BackWeb displays headlines of current events and allows you to click on those that interest you for additional information. The most common type of display in BackWeb is the InfoFlash, which appears as an animated ticker scrolling across your screen with newly arriving information. Clicking on an InfoFlash launches your favorite web browser with the complete article intact; unlike PointCast, there is no built-in viewer for browsing articles. While InfoFlashes are currently the most common form of content provided by BackWeb providers, the client also allows for software updates to be sent

out via specific channels as well as multimedia news flashes in the form of audio messages, screen savers, and background wallpaper graphics. These areas give BackWeb the most potential for success. Imagine subscribing to channels that offer you the ability to download the latest updates for your favorite software programs. The McAfee channel currently showcases this capability by making available the latest McAfee virus scanner updates when they become available. If BackWeb can get more companies to follow the trend set by McAfee, it will become another must-have net application. As it stands now, BackWeb is impressive but doesn't currently offer enough distinctive competencies to steal market share from the current leader. Still, keep an eye out for BackWeb — it could very likely surprise you in the future.

### FTP Icon Connection



<b>Desc:</b>	A FTP client that's all beauty and no brains?
<b>Pros:</b>	Great FTP client for novice netizens, attractive interface, firewall support, solid collection of FTP sites
<b>Cons:</b>	Lacks many critical features found in the competition, especially support for uploading files
<b>Location:</b>	<a href="ftp://ftp01.anawave.com/pub/tpic.exe">ftp://ftp01.anawave.com/pub/tpic.exe</a>
<b>Filename:</b>	tpic.exe
<b>Status:</b>	Shareware - \$29.95
<b>Company:</b>	Anawave Software, Inc.
<b>Website:</b>	<a href="http://www.anawave.com/ftpicon.html">http://www.anawave.com/ftpicon.html</a>

The first thing you'll notice about FTP Icon Connection (FTPic) is its attractive interface. With its appealing layout and graphical representations of FTP sites, FTPic makes transferring files a fun, quick and painless process. FTPic's interface primarily takes its cues from Windows 95 and adds its own unique attributes, but look for most options to closely mirror those found in the Windows 95 Explorer. For instance, as with Explorer, there are four display options for viewing the contents of a remote site: large icon, small icon, list, and detail views. Unlike Explorer, FTPic lacks extensive right mouse button functionality and one-button sorting via clicking on column headers. In fact, FTPic's default alphabetical sort is the only sorting option available in the client. Your file management options are similarly limited — the extent of FTPic's capabilities are renaming, deleting, viewing, and downloading files as well as creating new directories. However, the client does provide sufficient firewall support as well as an extensive list of common FTP sites. Still, FTPic is quite superficial when it comes to offering more than just good looks. As with people, it's what's inside that counts, and FTPic in this respect doesn't quite measure up to the competition. While power users will quickly start to wonder whether FTPic is all beauty and no brains, novice users are bound to take pleasure in an interface that is easy to learn and use on an ongoing basis, especially those whose FTP needs are limited to downloading files from remote FTP sites. FTPic lacks the ability to upload local files, so if you're looking for a client that will help you maintain a web site or FTP server, FTPic is definitely not your best bet (try CuteFTP, WS-FTP, or FTP Outbox instead).♦

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# TUCOWS

Scott Swedorski

## THE ULTIMATE COLLECTION OF WINSOCK SOFTWARE

Scott Swedorski is president and founder of TUCOWS, The Ultimate Collection of Winsock Software. He lives in Flint, Michigan with his wife, Vicki and 2 daughters, Emily and Ashley. After joining the army at the tender age of 17, Scott received his degree in Computer Information Systems from Mott College, and received an Honorable Discharge after 8 years service. Scott welcomes input from Internet users and software developers at [tucows@tucows.com](mailto:tucows@tucows.com).

Welcome to the first *Boardwatch* TUCOWS column. Every week, the number one question we receive at our Web site is, "Why the name TUCOWS?" TUCOWS is an acronym for "The Ultimate Collection of Winsock Software." We began serving the public in 1994 by archiving, reviewing and distributing top Internet applications through our site on the WWW ([www.tucows.com](http://www.tucows.com)). Since then, TUCOWS has earned a reputation for being one of the top software distribution sites on the Internet, receiving over 20 awards and citations, including PC Magazine Top 10, Yahoo! Pick of the Week, and MSN Pick of the Week.

TUCOWS also stands alone by virtue of having over 150 Mirror Sites on 5 Continents, in over 40 Countries worldwide. Over 2 gigabytes of shareware software and HTML is stored on separate servers on each of those mirror sites, ensuring faster downloads and eliminating those annoying "Busy, too many user" messages. TUCOWS is also one of the 50 busiest sites on the Internet, serving over 300 million pages per month.

### RATING SYSTEM

What do all of these cows have to do with software? Simple: The more cows an application is awarded, the more you need the program. 5 Cows is our top rating.

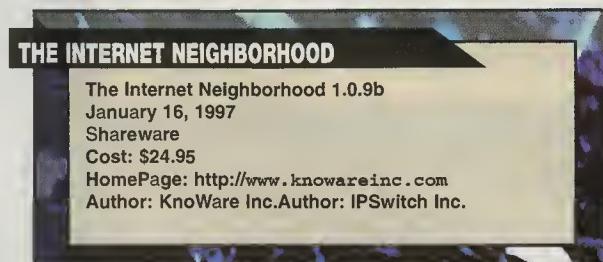
#### RATING SYSTEM

5 Cows:	Must have!
4 - 4.5 Cows:	Excellent
3 - 3.5 Cows:	Good
2 - 2.5 Cows:	Fair
1 - 1.5 Cows:	Needs improvement

In this issue, we'll look at some of the best current applications for File Transfer Protocol (FTP). File Transfer Programs have been around forever, it seems, but in the last couple years, Shareware manufacturers have transformed the old command-line protocols into easy-to use programs for all platforms.

FTP evolved in the early 70's from a simple command-line method of transferring files between remote ARPANET servers. FTP's primary function was defined as "transferring files efficiently and reliably among hosts and allowing the convenient use of remote file storage capabilities." A comprehensive history and specifications for FTP can be found at [ftp://nic.merit.edu/documents/rfc/rfc0959.txt](http://nic.merit.edu/documents/rfc/rfc0959.txt).

### WINDOWS 95 APPLICATIONS:



Why fool around with "Explorer-like" FTP clients when you can use Explorer itself? The Internet Neighborhood is a plug-in for the Windows '95 Explorer. In addition to adding and renaming local and remote directories, you can now add new FTP sites. To download files, just drag and drop them from the FTP directory to any directory on your hard drive. You can even configure The Internet Neighborhood for use behind a firewall.



The biggest drawback to The Internet Neighborhood is that the featureset is extremely limited in the shareware version. In fact, Knoware does not allow any of the aforementioned features to be tested and users are only allowed to have two FTP sites configured. There are future plans to add an import filter for configurations of other Windows FTP clients such as CuteFTP and WS\_FTP32. But again, these extras will only be available to registered users. If you are already comfortable with the Windows 95 Explorer interface, then The Internet Neighborhood will be a great match for you.

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\* Ask for your free *True Digital* White Paper.

## **PortMaster 3 Highlights**

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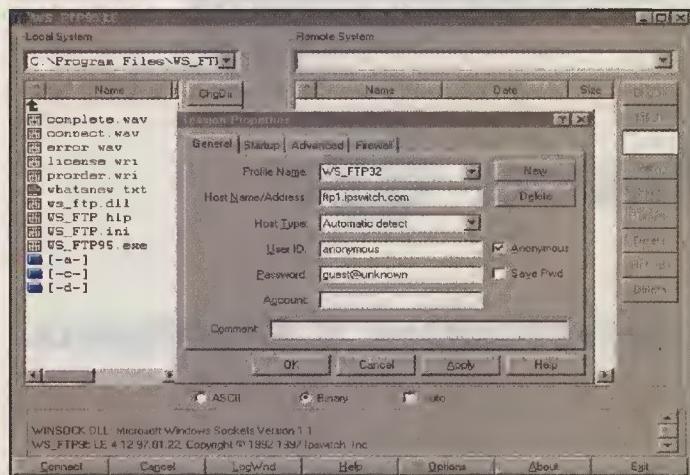
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## WS-FTP LE 4.12

WS-FTP LE 4.12  
January 22, 1997  
Byte Size: 875,602  
Freeware (For non-commercial use),  
Win3.x version available  
HomePage: [http://www.ipswitch.com/pd\\_wuftp.html](http://www.ipswitch.com/pd_wuftp.html)  
Author: IPSwitch Inc.

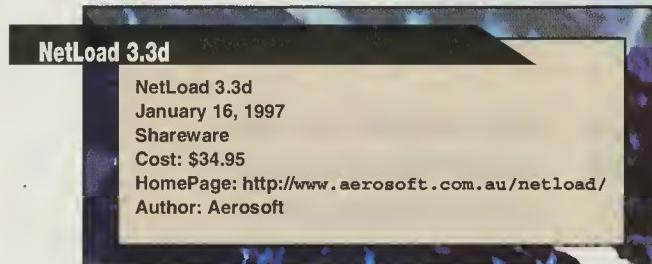
**WS-FTP** is an extremely popular FTP application with new Internet users because it automates some of the more arcane UNIX commands that have plagued newbies for years. It offers advanced capabilities such as automatic renaming of files and easy-to-use upload and download functions. Those features, combined with an intuitive graphical user interface, make WS-FTP one of the best FTP applications for Windows users.



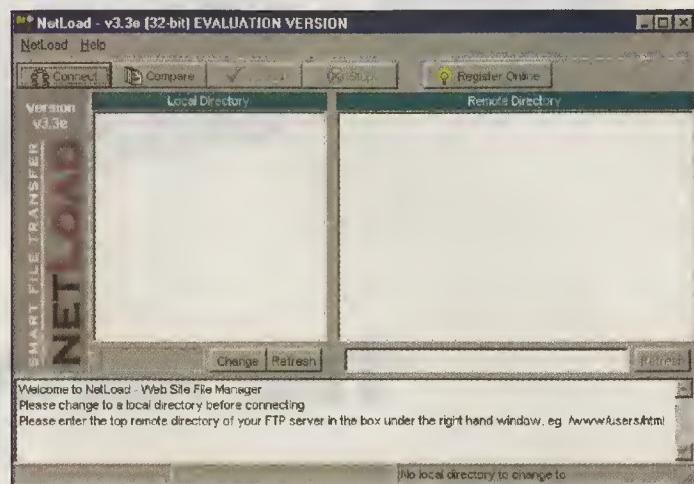
To the benefit of more advanced users, IPSwitch has thrown in a complete set of network utilities designed to troubleshoot potential network problems or locate and display information about organizations, computers and people on the network. WS\_FTP also allows remote file editing, and automates some UNIX box commands including chmod, Lookup, Ping, Traceroute, Whois, and Finger. Although free for non-commercial use, an enhanced professional version is available to commercial users for **\$37.50**, which includes Auto re-get, a feature that saves time by automatically resuming interrupted transfers when you reconnect to the site.



WS-FTP easily rates five cows, I heartily recommend it, especially to new Internet users.



**NetLoad** is an attractive and easy-to-use file transfer system that can automatically update files and entire directory structures on conventional FTP servers. Additionally, it can synchronize multiple FTP servers automatically on a pre-set schedule. Users can update specific sites daily, setting the program to automatically remove outdated files or directories, leaving no "trash" behind. If needed, NetLoad builds new directories to keep sites synchronized. These features can save a busy webmaster or FTP-site administrator a lot of time, particularly if your sites need to be updated frequently. As more web sites make use of the "mirror" concept, demand will grow for programs like NetLoad.

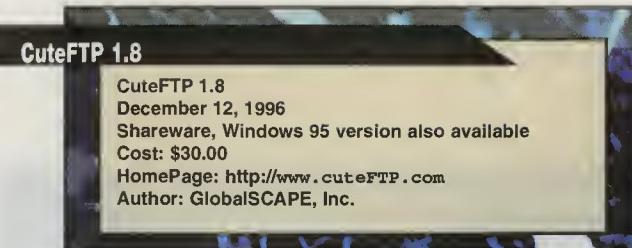


NetLoad has configurable options to work from behind a firewall, and works with Wingate, a program that permits multiple networked computers to access the Internet through a central Win 95 or NT machine. The evaluation version is somewhat limited. It contacts a Permission Server in Australia which gives you 50 full transfer sessions. If the server cannot be contacted, or the 50-use limit has been reached, NetLoad will only transfer files less than 1024 bytes.



If your responsibilities include overseeing multiple Web sites or FTP directories, you will save a lot of time by using this 5 Cow application.

## WINDOWS 3.X APPLICATIONS:

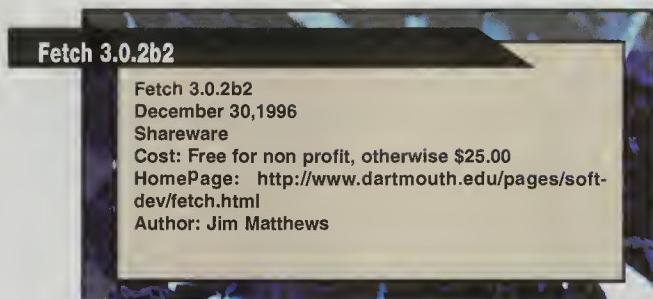


**CuteFTP** is by far one of the best known Windows FTP applications on the Internet. There are loads of features from full drag and drop, to my favorite feature, auto-resume downloads (remember "Z-Modem" from the BBS days?). If you have ever been disconnected while downloading a large file, you'll appreciate CuteFTP's ability to re-start and continue your download.

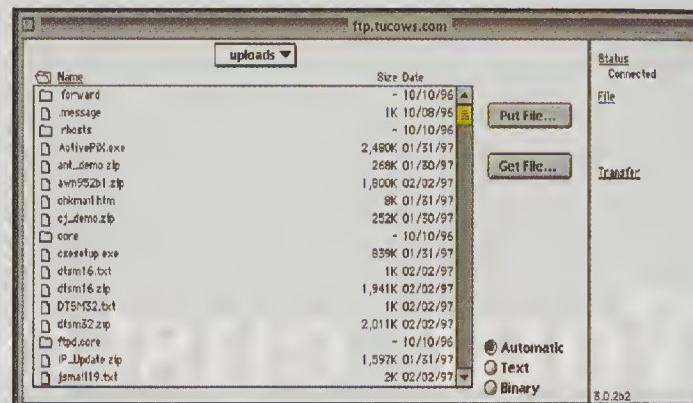
CuteFTP has an attractive interface, similar to Windows Explorer. It offers a "site manager," where you can also set such things as the default download directory for each FTP site, specify a text viewer, or customize your display and fonts. You can drag and drop entire directories (including their contents) as well as "spawn" another session, and automatically have another connection to the same site for faster transfer capabilities on slower sites. The Site Manager stores sites in a folder-style shell, separate from the main client, to avoid clutter. CuteFTP is configurable for operation behind a firewall. You may also define custom commands - a useful feature for more experienced UNIX users who do not wish to spawn a separate Telnet session to execute commands.



#### MACINTOSH APPLICATIONS:



**Fetch** is the finest Macintosh FTP program available. In fact, in the Macintosh world, the word "Fetch" is used more often than "FTP." Now in public beta testing, Fetch 3.0.2b2 includes many bug fixes, and is the first Mac FTP client to support resuming downloads. Fetch 1.0 was written in the summer of 1989, to provide a file transfer solution for Macs connecting to Dartmouth University's various host operating systems. Version 1.0 was a Macintosh desk accessory, and communicated with TCP/IP machines via an AppleTalk stream protocol (the Kiewit Stream Protocol) and Philip D. L. Koch's KSP TCP gateway. Fetch later incorporated CStream, a network class library, which provided support for MacTCP, and the ability to



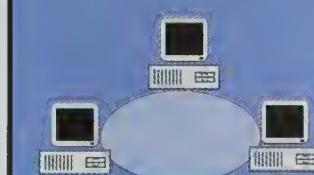
transfer directory trees, suffix mapping, StuffIt! decoding, and AppleSingle support. Version 3.0 supports multiple connections, drag and drop, Internet Config, firewalls, AppleScript, and a variety of other features.

Fetch has built-in Apple events, allowing users a powerful scripting tool. Users can automate many processes, saving time and money. Fetch is the only Mac FTP client with Apple Event Object Model support, for easier and more powerful scripting with languages such as AppleScript, Frontier, and others. Fetch is also "recordable," so writing a simple script can be as easy as hitting the "Record" button in your script editor. Fetch allows multiple outstanding connections, and automatically reconnects sessions that have been disconnected. Fetch features extensive support for drag and drop (which requires System 7.5, or the Macintosh Drag and Drop extension and Finder 7.1.3 or later). Files and directories can be dragged to and from remote sites. URLs can be dragged to bookmark list windows and text editors. Some preferences can be set via drag and drop. Fetch supports uploading and downloading files in AppleSingle, BinHex, and MacBinary II format, as well as the common Text and Raw Data formats.



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And, hey. Have a nice day."



Over 300 ISPs and online service providers and more than 100 PC and modem manufacturers already support Rockwell's K56Plus technology.

Seventy-five percent of the world's modems carry a Rockwell chip inside.





## A HIGH-TECH SOCIETY THAT SET THE STAGE FOR ITS INTERNET PRESENCE

By Vito Echevarría

**I**srael has had to contend with preparing itself militarily in the face of hostile Arab neighbors since its birth in 1948. Israel's need to defend itself against countries with larger populations necessitated the drive to develop its technological capabilities.

During the 1950s, the first Israeli technology firms emerged. Such companies, like Tadiran Ltd., Telrad Telecommunications, and Electronic Industries Ltd., were Israeli military contractors. However, due to current restructuring in Israel's economy, these firms have had to re-orient themselves to meet commercial demands.

The Israeli military laid another foundation for the large presence of high-tech firms through its promotion of networking and training for Israeli technologists. A large number of Israeli soldiers receive technical training while serving in the military.

That, along with recent arrivals of well-educated immigrants (particularly from Russia), has helped shape the existence and growth of Israel's own Silicon Valley. Known locally as "Silicon Wadi," the region bounded by Haifa, Tel Aviv and Jerusalem is home to many high-tech firms. Israel's high-tech brain power is undeniable: 130 of every 10,000 workers in Israel are engineers (compared to 70 in the U.S. and 65 in Japan).

Thanks, in part, to these phenomenon, the current Israeli economy is very strong. In 1995, Israel's biotechnology industry grew by almost 14% and its electronics industry, which exports almost 25% of its own goods, enjoyed a nearly 29% growth rate. Other hot sectors in the Israeli economy include medical technology and pharmaceuticals.

In 1994, Israel's high-tech industries accounted for US\$3.7 billion of the county's US\$15 billion in exports. Israel hosts subsidiaries of major American firms like Intel, Motorola, and Microsoft. The electronics industry created 40,000 Israeli jobs, and the software industry another 2,000 (out of a workforce of 2 million). Against this background the Internet has tremendous growth potential in Israel.

## ISRAEL'S WORLD WIDE WEB SITES

MINISTRY OF INDUSTRY AND TRADE -  
THE CENTER FOR BUSINESS PROMOTION  
(<http://www.cbp.gov.il>)



### Ministry of Industry & Trade

This Israeli government web site is dedicated to helping foreign firms and organizations find prospective business partners among some 1,000 Israeli companies. It also provides access to information on Israel's economy and industrial climate.

There's a link to the Israel Investment Center (<http://www.cbp.gov.il/inter02.html>), which exists to encourage economic initiatives, industry, and tourism. The Center services potential capital investment aimed at expanding Israel's production capacity, thus creating more jobs. It has the power to grant "Approved Enterprise Status" for capital investments in industry and tourism. Such status provides investors with substantial state support including reduced taxes, investment grants, and state-guaranteed loans.

A link to the Center for Business Promotion (<http://www.cbp.gov.il/inter03.html>) provides details on the Law of Encouragement of Capital Investments (1959). The law, which has been associated with Israel's production capacity to extend GDP growth, provides for:

- Direct grants as a percentage of total investment
- Research and development (R&D) financing
- Tax relief and tax breaks

In addition, there's also a link to the Center for Technological Initiative (<http://www.cbp.gov.il/inter05.html>) which is run by the Office of the Chief Scientist. Its objective is to foster and further technological innovation and assist initiators, to help new immigrants realize their potential and ideas, and to place skilled immigrants in an R&D work environment.

### NEWS GUIDE - ISRAEL'S HITECH NEWS FORUM (<http://206.43.192.113>)

## NewsGuide Israel's Hitech News Forum

This site provides free news about Israel's high-tech industries, updates on the status of R&D projects, and links to noteworthy high-tech community sites. Another link, NEWS GUIDE's business directory, is a database of Israeli high-tech firms, from new start-ups to local subsidiaries of multi-national companies.

There are also links to CHIP TALK (<http://206.43.192.113/newschip.htm>), a monthly newsletter about the world of semiconductor technology, and AEROSPACE REVIEW (<http://206.43.192.113/aeroframe.htm>).

## A SAMPLE OF ISRAEL'S INTERNET SERVICE PROVIDERS

According to Meny Nachman of Israeli ISP Aquanet, there are 9 ISPs serving 100,000 users. Additionally, universities provide free e-mail to approximately 50,000 students.

As of August 1996, there were 39,611 host sites in Israel (with 1,275 queried, 171 missed). The following is a sample of the available Internet services in Israel:

### AQUANET (<http://www.aquanet.co.il>)



A relatively new entry to the Internet consumer market in Israel, Aquanet offers an array of Internet services, including "who is online," online password changing, full e-mail service, WWW, a free home page, IRC and Web Chat, newsgroups, Usenet, Listserv, and even a free greeting card service. Its user-to-line ratio is 10:1.

#### Types of Service

Aquanet offers 2 options after charging approximately US\$30 to open an account.

- Option A - Unlimited Internet Access for US\$19.99 per month. An additional US\$8.50 will be charged for those who don't want to pay via credit card. Clients will not be charged for a calendar month in which they do not connect.
- Option B - Dialing via Bezeq, Israel's phone company. Clients are charged US\$0.009 (less than a penny) per minute for Internet service plus a local phone call connection fee. This option is good for customers who don't surf much or do not wish to decide at the start of the month how many hours they will be surfing. The bill is paid directly to Bezeq along with phone charges and a credit card is not necessary.

Note: All rates do not include 17% Value Added Tax.

#### Areas

- Jerusalem
- Tel Aviv
- Haifa
- Ramat HaGolan
- Arad
- Modi'in,
- Netanya
- Bezek

#### Contact

Tel.: (972)(3) 536-6503

E-mail: [support@quananet.co.il](mailto:support@quananet.co.il)

[meny@quananet.co.il](mailto:meny@quananet.co.il) (Meny Nachman)

Nachman explains Bezeq's role in his ISP business: "Bezeq, the national telephone company, set modems in all area codes, connected to ISPs like Aquanet to save the ISP the need to invest in modems, and to save clients long distance call fees."



Providing Internet service since June 1993, Actcom was one of the first Israeli ISPs. Actcom provides services ranging from a single use account to a full network connection, from SLIP/PPP and terminal emulation to a dedicated connection.

Actcom is located in Haifa and supports local phone calls within the 02, 03, 04, and 07 calling areas. Connection through Bezeq's services is also supported.

#### Services

US\$29 per month for terminal (text) access only  
US\$34 per month for both SLIP/PPP and terminal access  
Reduced subscription fees for users paying by standing order (Hora'at Keva) or automatic credit card debits.  
US\$25 per month for terminal (text) access only  
US\$30 per month for both SLIP/PPP and terminal access

Service includes:

- 35 hours/month (connection time between 02:00 and 14:00 is not counted)
- Free Internet traffic via SLIP/PPP
- 30 MB/month Internet traffic via terminal connections (mail and direct SLIP/PPP traffic is free of charge)
- 8 MB disk allocation
- 1 additional mailbox for no additional fee
- 1 e-mail alias for no additional fee
- 100 KB home page under ACTCOM's domain

#### Additional Usage

##### Terminal Time

- \$.85/hour
- \$.95/hour SLIP/PPP time

##### Non-SLIP/PPP traffic

- \$.90/MB

##### Disk Space Allocation

- \$.60/MB - \$1.80/MB per month

Access via Bezeq is available in both terminal and PPP modes. For this service, Bezeq charges one "unit" for every five minutes regardless of location or time. The rate is equivalent to the regular phone rates of a local call between 8:00 AM and 4:00 PM on working days.

#### Discounts (subscription fee only)

- 8% for payment for 6 months in advance
- 20% for payment for 12 months in advance

#### Areas

- 02, 03, 04, 07, and 09 calling areas.

#### Contact

Tel.: (972)(4) 867-6115  
Fax: (972)(4) 867-6088  
E-mail: [info@actcom.com.il](mailto:info@actcom.com.il)



IBM Israel dial-up Internet connectivity services are made available via SLIP-based local points of presence (POPs) servers. These POPs are currently in the 03 and 04 dialing areas and will soon operate in the 09 area code. Regular Internet services include dial-up Internet access, e-mail, WWW page hosting, Usenet newsgroups, and IRC services.

#### Services

##### Dial-Up

Subscription Rate : Flat US\$25 per month.

IBM Israel offers certain advantages over other Israeli ISPs. For example, IBM has a fast path to the Internet backbone in the U.S. and Europe. Also local dial-up connectivity is offered in over 50 countries and over 700 cities. Free technical support is included.

##### Leased Line Service

IBM Israel's wide-band Internet infrastructure is based on a fast 1.5 Mbps T1 link, which is completely devoted to transferring Internet data to and from Israel. IBM Israel provides leased lines from the customer's premises, using SIFRANET or Frame Relay links at data rates ranging from 9,600 to 64,000 Kbps.

Leased line services are offered in two varieties:

- Non-managed service: leased-line connectivity to existing communication equipment at the customer's premises.
- Managed service: a comprehensive turnkey solution which combines ordering a leased line from Bezak, installing a router, administration and maintenance.

Note: Rate information on IBM Israel's leased line service was unavailable at press time.

#### Contact

Rechov Weizmann  
Tel Aviv, Israel  
Tel.: (972)(177) 022-1933 or  
(972)(03) 697-8672 (leased line information)  
Fax: (972)(03) 697-8115  
E-mail: [sales@ibm.net.il](mailto:sales@ibm.net.il) [hank@ibm.net.il](mailto:hank@ibm.net.il)  
(Hank Nussbacher, Internet Tech. Manager)



NetVision, Israel's largest ISP, offers full Internet access and services such as e-mail, FTP, newsgroups, telnet, and WWW.

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**(888) 747-4872**

## Services

The Gold Account is a single-user dial-up connection with the following features:

- Private user name and secure e-mail box
- US\$50 for 40 hours/month (US\$1 for each additional hour)
- Free modem use between 2:00 am - 7:00 am
- 85 MB average daily use of disk space for e-mail
- Unlimited data transfer
- USENET news services
- Anonymous FTP area (5 MB for 48 hours)
- Special price for Net Manage's "Internet Chameleon" software, with Hebrew booklet and built-in NetVision configuration
- Personal home page
- Temporary account blocking
- Temporary mail forwarding
- Online, real-time monthly modem usage report capability (including both billable and free hours)
- Technical support 24 hours/7 days a week

The Introductory Account is similar to the "Gold Account"

- US\$25 for 20 hours/month
- US\$1.40 for each additional hour

The Basic Account is also similar to the "Gold Account"

- US\$15 for 10 hours/month
- US\$1.50 for each additional hour

NetVision offers its customers the option to extend the size of their incoming e-mail boxes for US\$5 per month per increment of 5 MB.

NetVision also provides for Local Area Network (LAN) dial-up

connections, dedicated connections, commercial FTP service, commercial WWW service, LISTSERV service, domain name registration, and PPP connectivity for platforms such as Mac, OS/2, Windows 3.x, Windows NT, UNIX, and more.

## Areas

NetVision currently has seven POPs:

- |                    |                   |
|--------------------|-------------------|
| Jerusalem (02)     | Beer Sheva (07)   |
| Tel Aviv (03)      | Rehovot (08)      |
| Haifa (04)         | Herzlia Area (09) |
| Alonei Yitsak (06) |                   |

## Contact

NetVision Ltd.  
Advanced Technology Center  
Matam Post Office  
31905 Haifa, ISRAEL  
Tel.: (972)(4) 856-0600  
Fax: (972)(4) 855-0345  
E-mail: [info@netvision.co.il](mailto:info@netvision.co.il)



The Internet phenomenon is likely to continue growing in Israel, given the country's high-tech population and the October 1996 *Ma'ariv* survey concluding that 44% of Israelis own a PC. Israel is also embracing other high-tech communications. Almost 16% of the Israeli population use cellular phones.

Thanks to government initiatives for cheaper cellular phone use, air time in Israel is a fraction of what it would be in the U.S. Israelis use cellular phone four times as much as Americans. Given the current Internet rates, will the Israeli government take similar steps to lower the costs of surfing the net? ♦

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# ZAMBIA Connects VIA SATELLITE TO THE U.S. BACKBONE



Like most of its African neighbors, Zambia is a mining country that exports various metals. Copper is one of its biggest exports. So, what does a country with so much copper use for telephone service? Air. Telephones in the U.S. connect to central offices using copper wire, and central offices are tied together through spans of fiber and copper. In south African nations, however, central offices are tied together via microwave, so there are no "backbones" in Zambia like there are here in the U.S. Zamtel, the Zambian phone company, is among the best in its region for infrastructure and technology. But that's not to say Zambia, and its neighbors, are not modern. Weather, lack of infrastructure, even a hijacking became obstacles to high-speed Internet access in Zambia. A satellite dish rests on the roof of the Humanities building at the University of Zambia in Lukasa, the nation's capital. The dish, a Prodelin 1257-425R, is part of an earth-station that provides Zambia with its only 56K connection to the Internet.

By

Steve Clark

For almost 2 years, ZamNet fulfilled the entire country's Internet needs with a single 14.4 modem connection. It worked fine for web browsing when the customer base was small. But as the Web's popularity increased, even in Zambia, so did the demand for Internet access.

With 1,500 customers surfing the Web, and over 2,000 e-mail boxes to serve, ZamNet had to find a faster connection. In January, after months of planning, purchasing, installing, and testing, ZamNet connected to UUNET's U.S. backbone via satellite. Just as ISPs in the U.S. lease T-1s from their local telco, ZamNet is leasing satellite space from PanAmSat ([www.panamsat.com](http://www.panamsat.com)). Specifically, they're "connected" to PAS-3, which is one of PanAmSat's Atlantic Ocean Region satellites serving Africa. Internet packets sent to one of ZamNet's routers are sent to the C-Band on PAS-3 and then reflected to PanAmSat's Global Operations Center in Atlanta. Packets are then routed to a local UUNET backbone connection. This entire connection is a service of PanAmSat called SPOTbyte, which provides similar global Internet service to ISPs in Latin America, Asia, and now Africa.

Neil Robinson, ZamNet's senior communication software engineer, blames the early February rain on a string of tropical cyclones over northern Madagascar. ZamNet is Zambia's first and only Internet service provider. Like many of their ISPeers around the world, ZamNet has endured tremendous growth over the past several years.

Zamtel, the telco, has been threatening to enter the ISP business some time this year. Other start-ups are rumored to enter as well, but ZamNet persists with competitive pricing and excellent customer service.

Originally, the folks at ZamNet were hoping to get a high-speed connection to Internet Africa in South Africa, their original ISP. There was a good working relationship between both companies. Due to Zambia's infrastructure, it would be impossible, for example, to run a 1,400 kilometer T-1 from Lukasa to Cape Town. Therefore, satellite was the only option.



But such a connection meant using an Intelsat satellite, which also meant using Zamtel. ZamNet proceeded with the necessary paperwork. For some reason, a simple administrative process lasted for over three months. When it became apparent that someone at Zamtel dropped the ball, the ZamNet crew decided to seek an alternative.

After contacting UUNET-Pipex in Cambridge, ZamNet decided to use the PanAmSat's SPOTbyte service which would tie them in to the European and U.S. backbones through Atlanta. As Robinson notes, "UUNET's connections world-wide are so fast so the actual location was not so important." Since the Internet in the U.S. has so much traffic and so many mirrored sites, Atlanta is probably ZamNet's best available link.

The earth-station was set up by the suppliers, Dimension Data of South Africa. Several months after the order

figure the routers and the network, just like other ISPs.

## ZAMNET HISTORY

ZamNet grew out of a non-commercial fidonet based e-mail service at the University of Zambia Computer Centre. Like ARAPNET in the U.S., the group served the academic community. In 1994, ZamNet emerged from this group as a commercial Internet provider when they leased a 14.4 modem connection to Internet Africa, a dominant ISP in Cape Town.

The initial connection took months to establish. ZamNet had trouble working with their modems and their phone company. Their facility is about 7 kilometers from the nearest central office which is long enough to cause considerable signal loss. The 16dB loss meant that they needed to get specially configured modems. To make matters worse the ZamNet technicians tried to use

Finally, the techs at ZamNet decided to buy some Telebit Fastblazers, which are 4-wire modems. But their order was apparently shipped in a van that was hijacked in Johannesburg. All things considered, it is amazing that ZamNet was able to get their commercial service off the ground in less than 4 months.

Through copper lines in Lukasa, satellite earth-stations, and digilinks in South Africa, a link to Internet Africa was established. ZamNet became the fifth African country with Internet access.

The increase in bandwidth allows ZamNet to be aggressive and actively sign-up new subscribers. Their business had grown from next-to-nothing to 1,500 customers in 18 months — without marketing. Since a 14.4 modem connection could barely service that many subscribers even for e-mail, ZamNet needed to be cautious about expanding too quickly.

So, they invested US \$40,000 in new hardware that would allow them high-speed, digital access to the U.S. backbone. "Now we can really sell the Internet," says Robinson, "knowing that we can handle the demand and grow quickly to accommodate it as it increases."

This month, ZamNet plans to disconnect their modem connection to Internet Africa. It had been serving as redundant link in case the satellite connection failed. But ZamNet is going in a new direction now, hoping to install a second earth-station in Zambia's Copper-Belt some time this year. This second site will bring enhanced

high-speed Internet access to the people of Zambia. Welcome.

To learn more about ZamNet and Zambia, and to experience the Internet via satellite, go to their URL at [www.zamnet.zm](http://www.zamnet.zm). ♦



PanAmSat's Global Operation Center in Atlanta.

was placed, the 2.4 meter dish arrived along with a few technicians. After that it took about a week to assemble, configure, troubleshoot and test. The ZamNet crew learned enough during the installation to support the equipment in the future. With the earth-station in place, they only needed to con-

figure the routers and the network, just like other ISPs.

Telebit Worldblazer modems, assuming that the devices could be used for 4-wire communication. The Worldblazers would only work for 2-wire communication, so converters were attached. But the converters caused a local echo problem, which could not be solved with any echo suppressers.

# Satellite Subscription Systems Shaping Up

By Steve Clark



Satellite connections are beneficial, especially for long distance spans or in regions with limited infrastructure. For example, a land-based 128K line from the U.S. to Zimbabwe can cost \$25,000 per month. But, you're lucky to get 28K because the line is actually a channel of an overcrowded T1. With a similar satellite connection, you can get a full clean T1 for about the same monthly cost. (A clean 128K will cost about \$15,000 per month.) Although the signal travels about 50,000 miles via satellite, as opposed to roughly 10,000 miles via terrestrial link, it is a clean signal and is over ten-times faster than the dirty 128K land-line. The difference in throughput compensates for the extra distance traveled.

Earth station is the term used to describe the unit that sends and receives signals to the satellite. The unit is composed of an antenna, low-noise amplifier (LNA), down-converter, and receiver electronics. Because components are often built by separate companies, there are no pre-fabricated earth stations. As an ISP, you don't need to build the earth station yourself, but you do need to hire someone to do it. Your satellite provider will recommend someone.

The antenna, which is the "dish," can range in size from 65 centimeters (approx. .2 feet) to 30 meters (approx. 100 feet). A dish's size is related to the throughput it can generate. T1 and above bandwidth is not possible with smaller dishes — those less than 4 meters (approx. 12 feet). Earth stations for T1 bandwidth can cost between \$250,000 and \$1 million. If you're spending that, you might as well go for the biggest earth station you can afford to meet your future needs.

## TYPES OF SERVICES

- PanAmSat offers its SPOTbyte (<http://www.panamsat.com/gic/gic.html>) service in levels of 64K, 128K, 256K, 512K, 1.544Mbps (T1) and 2.048Mbps (E1). Plans are in the works to for 45Mbps (T3) as well, but no time frame is available. Satellite connections are linked to UUNET's backbone in Atlanta or northern California.
- NSN has an satellite Internet system called InSAT (<http://nsn.net/insat.html>). It is a custom designed all-in-one package including earth stations, servers and satellite Internet services. NSN uses a 100Mbps connection to MAE WEST as its link to the Internet.
- General Electric offers Spacenet, ([www.ge.com/capital/spacenet/sn6.htm](http://www.ge.com/capital/spacenet/sn6.htm)) another all-in-one satellite Internet service. There is only one person in America who can answer questions about it, and he was out of town when we called. This stealth salesperson receives e-mail at [spacenet.spacenet@capital.ge.com](mailto:spacenet.spacenet@capital.ge.com).
- Savvis Communications ([www.savvis.com/satellite\\_srv.html](http://www.savvis.com/satellite_srv.html)) plans to roll out 45Mbps ATM satellite transmissions this fall to developing parts of the world. ATM will also allow them to deliver other services like phone and video, without having to invest in extra earth stations. Savvis has been working with Post Telephone and Telegraph Administrations (PTTs) in African countries because the PTTs already have the expensive earth stations in place.

## SATELLITE SERVICE PROVIDERS

Name	Service	Availability
<b>Savvis Communications, Inc.</b> St Louis MO, 63105 (800)SAVVIS1 (888)934-2666 <a href="http://www.savvis.com">www.savvis.com</a>	ATM 45 Mbps service worldwide T1 from U.S. to Africa — approximately \$30,000 per month <a href="http://www.savvis.com/satellite_srv.html">www.savvis.com/satellite_srv.html</a>	Fall 1997
<b>NSN Network Services</b> Avon, Colorado 81620 (970) 949-7774 <a href="http://nsn.net">http://nsn.net</a>	InSAT NSN provides earth stations, servers and satellite links. Prices not available <a href="http://nsn.net/insat.html">http://nsn.net/insat.html</a>	Now
<b>PanAmSat</b> Greenwich, CT USA 203-622-6664 <a href="http://www.panamsat.com">www.panamsat.com</a>	SPOTbyte Satellite links from 56K to T1 Prices not available <a href="http://www.panamsat.com/gic/gic.html">www.panamsat.com/gic/gic.html</a>	Now

ISPs in those countries will be able to connect to the U.S. backbone through a local PTT which will connect to Savvis via satellite.

## PRICING

Logically, a satellite link might be broken into 2 parts: A connection fee for the right to use the satellite, and a usage fee for the time, space, or bandwidth used. But, according to PanAmSat, a satellite fee is more of a flat-rate plan than a dynamic one. Although price quotes are not available, PanAmSat does promise to design a plan to suit your needs. If you are unsure of your needs, however, your needs will be decided for you.

PanAmSat's web site has an online form (<http://www.panamsat.com/gic/meet.html>) you can complete and submit. After disclosing several key nuggets about your ISP, a PanAmSat representative will get back to you. In addition to the standard name, address, and phone number information, you must disclose how long you've been in business, financial backer, and your estimated annual revenue. This helps PanAmSat to decide how much they can charge you.

Although they won't have a satellite service until Autumn, the folks at Savvis are ready to talk. Because they're a backbone operator, their focus is on getting clients connected to their PNAPs. They have no vested interest in satellite equipment and will design a package that best suits the satellite needs of their client. If your ISP is near a satellite facility like a television station or telephone company, then Savvis can help you get the satellite connection you need.

In some ways, buying a satellite dish for your ISP is like buying a cellular phone. You don't really buy the phone, you buy some package of air time in which you commit to spending \$30 a month for the privilege of being billed for using the thing. And the phone will only cost you a penny. Satellite vendors seem to work in a similar way. They sell you some package, send you their consultants who put a dish on your roof, and send you a \$50,000 bill for a "setup fee."

The difference is, however, that when you get one of these cell-phone deals, you know the price. You can walk into a supermarket and get a new cell-phone. Some are free, others will cost more and set you back a penny. The point is that cell-phones are everywhere and satellites are not. The satellite business is one of high-costs and high-prices. You

would think that if some company spends billions of dollars to build, launch and support a high-tech device at 24,000 miles above sea level, it would try to make as many sales as possible. Satellites are not cheap, and if you own one you might want to generate some business to support it.

Satellite suppliers are vague with pricing and availability, and most vendors who make satellite earth stations do not sell satellite connections. That's logical since Cisco and Kentrox don't lease T1s. As an ISP, you buy a CSU and lease some conditioned pairs from your local telco — sometimes as a part of an easily understood package. But

once you enter the satellite arena, you're at the mercy of consultants who are really independent reps for earth station manufacturers and satellite service providers.

The Savvis plan, in the long run, offers the most efficient implementation of Internet satellite technology. Investing in a small earth station, one that can't go beyond 128K, might be as wasteful as buying a bank of 9,600 baud modems in 1994. The technology for relatively inexpensive Internet satellite connections is about to emerge, so it might be wise to sit tight for a few months and see what happens. It will probably take six months to get a price. ♦

## INTERNATIONAL INTERNET PROVIDERS USING SATELLITE CONNECTIONS

ISP Name	URL	Country
Red Cientifica Peruana	<a href="http://www.telconet.net">www.telconet.net</a>	Ecuador
Planet Internet	<a href="http://www.pla.net.py">www.pla.net.py</a>	Paraguay
Internet Peru	<a href="http://www.rcp.net.pe">www.rcp.net.pe</a>	Peru
Infomail Uganda	<a href="http://www.imul.com">www.imul.com</a>	Uganda
ZamNet	<a href="http://www.zamnet.zm">www.zamnet.zm</a>	Zambia

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**CASH 5: 2, 12, 18, 23, 27**

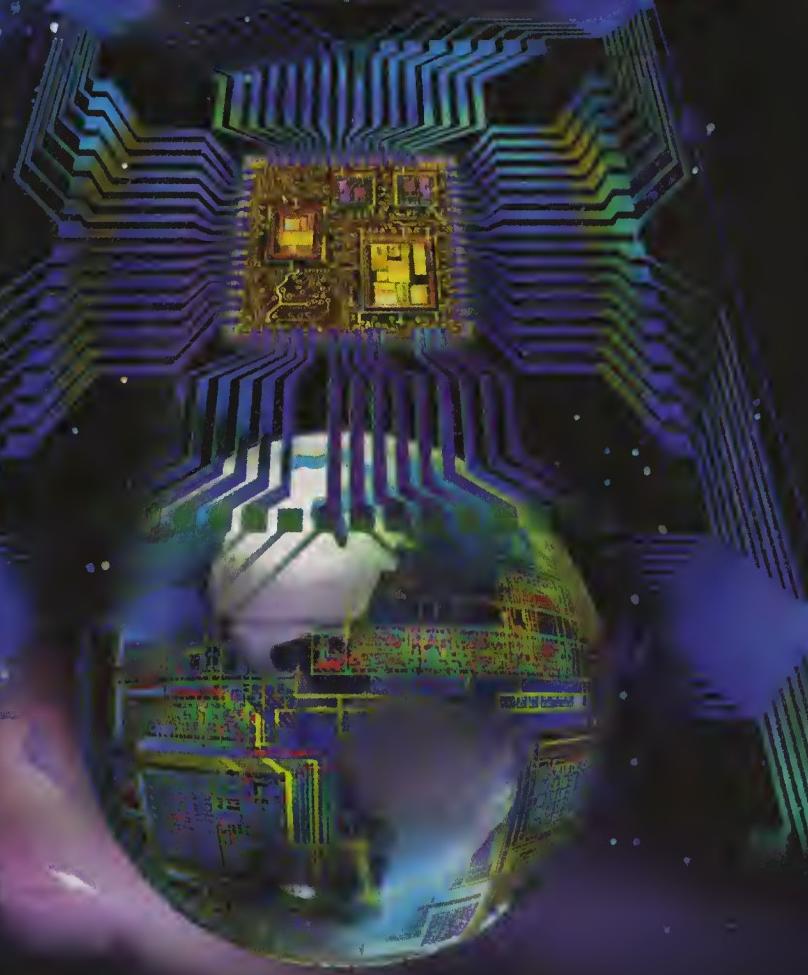
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THE  
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*Rockwell Deploys K56 Technology  
to the Modem Universe*

# 56K MODEMS

## The Battle Continues

The battle over the next increment in dial-up modem technology is notable both in its intensity, and in the fact that it is happening at all. With much talk of ISDN and xDSL, many in the industry considered dial-up modems over analog POTS (plain old telephone service) lines mature with the advent of the 33.6 kbps V.34bis standard. Public discussion of a new 56 kbps modem standard began with a white paper release in September by Rockwell Semiconductor Systems. In the interim, a public relations battle of unprecedented proportions has been waged.

Essentially three camps have emerged to tout 56 kbps technology. US Robotics launched a major promotional effort for their **x2** technology and appeared to have a significant time line lead over everyone else in the field. This largely due to their use of generic Texas Instruments Digital Signal Processor (DSP) chips and FlashROM that allow them to achieve 56 kbps across a large segment of their product line via a software upgrade. Then too, US Robotics sports a formidable marketing machine built to deliver what some estimate to be as high as 40% of the modems sold in the United States in the department store and retail channel.

Rockwell Semiconductor Systems supplies the chip sets forming the bulk of the circuitry in the modems offered by over a hundred manufacturers, including Cisco, Ascend, Diamond/Supra, and many more representing as much as 80% of the total modem manufacturers in the world. Their 56 kbps product line is referred to as **K56Plus**.

Lucent Technologies, the hardware/manufacturing arm of AT&T that was spun off as a separate company last September, has their own technology which they term **V.Flex2**. The Lucent version has an interesting option. The basic premise of 56 kbps technology is that it will support download speeds of up to 56 kbps, but uploads in the reverse direction would be limited to 33.6 kbps. Lucent claims to be able to deliver an optional feature of a 45/45 kbps symmetrical link providing 45 kbps speeds in both directions.

A fourth major modem chip manufacturer had been rumored to be testing similar product but not much information appeared to be available. Motorola owns what must be recognized as the first modem company — CODEX which essentially invented the modem many years ago. And within Motorola is a significant modem chip manufacturing capability, a line of modems, and apparently some moves into remote access server equipment as well. Motorola had formed the wildcard in this scenario, but in February the company announced it too would be using Rockwell chips in its product



line, as well as producing some of its own chips for some high-end modems somewhat later on.

As described in our January cover story, the three camps are not inherently interoperable. Alarmed at the US Robotics move to deploy their **x2**, Lucent and Rockwell Semiconductor had announced last November that their offerings would be made to interoperate at 56 kbps speeds in yet another new name — **K56Flex**. That doesn't mean that all features in both the K56Plus and V.Flex2 product lines will be available in all modems on all connections, but rather that a basic 56 kbps connection could be achieved between a Lucent powered modem and a Rockwell powered modem using K56Flex — at this point something of a subset. Lucent has patented several elements of their V.Flex2 which could lead to some interesting results later on.

In February, Motorola rather threw in with the Rockwell camp, creating essentially an unholy alliance of everyone else against US Robotics. In fact, Motorola settled a lawsuit with Rockwell over several patented technologies that were included in the V.34 ITU standard for 28.8 kbps modems. Basically, the theory is that if you can do V.34, you have used Motorola patents almost by definition. Rockwell licensed the patents from Motorola. Probably not coincidentally, on the same day, Motorola filed suit against US Robotics for patent infringement. Those same patent licenses would also be required for any 56K modems.

There are a couple of reasons for this strategy of join forces against the US Robotics "evil empire." First, all the players with the exception of US Robotics actually manufacture and sell chipsets more than modems. This has two effects in mar-

keting and in the basic business model. First, US Robotics manufactures modems from the very inexpensive Sportster and WinModem end up through premium desktop modems such as the Courier and Courier Imodem, and further up through remote access servers such as their MP8/16 and Total Control Network Server. It is a continuous line of products with few holes. Up to this point, their big gun has been the Total Control Server which could accommodate 48 ports but US Robotics is rumored to be working on a high density high port count product as well for release later in the year. And US Robotics has developed strongly appropriate channels for marketing all aspects of its line. It has an awe inspiring system of Value Added Resellers (VARS) selling the high end of the line, and an immense channel through department stores, computer stores, and other retail outlets for the more consumer oriented products. As a result, they can deliver a fairly uniform marketing message from television ads, print ads, right down through the point of sale display at the local CompUSA.

Rockwell, Lucent, and Motorola are virtually without a marketing capability of their own. They sell chips to vendors such as Ascend, Hayes, Diamond/Supra, Microcom, Zoom, and essentially everyone except US Robotics, and those companies in turn market their modem products in a variety of ways as each deem appropriate.

The second front is really an architectural war. As chip manufacturers, the large plants have a business model that presumes that with each upgrade in modem technology, they get to sell a new set of many millions of chipsets. The concept of generic DSP chips with the details of modem operation actually held in software, and the software held in rewritable FlashROM, is to some degree anathema to this model. If, for even a single generation, modems could be effectively upgraded to the next "great new thing" in software only, literally tens of millions of \$80 chipsets don't get sold.

Intel, oddly, may be the final arbiter of this particular architectural battle. They have come out with a new MultiMedia Extension, or MMX, feature in their line of central processors. The basic premise here is that the computer motherboard would contain a DSP, and ultimately the "modem" could TRULY be entirely in software run by the basic PC. This may be an extreme of this line of thinking. We're not sure we want our PC burdened with modem chores slowing down other operations, when a modem that can do that can be had for as little as \$100. But it illustrates how far this line of thinking can be taken.

US Robotics is first to market with their x2 modems which did finally show up in CompUSA stores during the week of February 24th. Cardinal, which has registered fairly impressive gains in market share in the past year, has licensed x2 technology for their Cardinal Connecta line and is one of the very few modem manufacturers allying with US Robotics in



**Dr. Dwight W. Decker**  
**President, Rockwell**  
**SemiConductor Systems**



**Armando Geday**  
**Vice President and General**  
**Manager, Multimedia**  
**Communications Division**

this battle. They are selling their internal model for \$179 and their external modem for \$199 — fully software upgradeable — more at [www.cardtech.com](http://www.cardtech.com).

## REALITY SETS IN

Our January cover story described, in somewhat gory detail, the basics of how modems work now, and specifically the theory behind upping the downlink speed to 56 kbps. Broadly, the concept is that modems are currently used to connect to a single Internet service provider central site, and that many ISPs were connected to the telephone company central office (CO) switch via digital trunks rather than analog telephone lines.

These digital trunks include 24 channel T-1 lines of 56 kbps, or Primary Rate Interface (PRI) Integrated Services Digital Network (ISDN) trunks of 23 or 24 channels at 64 kbps. By modifying the modems at the central site to communicate directly with the CO switch in its native digital protocol, an entire conversion process

from digital to analog at the central site is eliminated, and more importantly, the analog to digital conversion at the CO switch interface is eliminated entirely.

Triggered by US Robotics media blitz, all parties in this battle have been feverishly pumping the message that 56 kbps is coming. But modems in the lab and modems in a world of frayed cotton insulation and miles of small gage copper are simply modems in two very different environments. The uneasy reports from BOTH field camps in this battle are that 56 kbps may look remarkably like 48-52 kbps to most, and more like 42 kbps to some. A few lucky individuals with short local loops and flawless COs may actually achieve 56 kbps, but they would be the rare exception.

One of the things that came out early was that some of the basic assumptions in the lab were wrong. The most glaring was in unintended infringement of the FCC part 68 rules regulating signaling levels in local loop telephone lines. This situation is poorly understood and has been widely misrepresented by almost every news article we've seen on this topic.

Basically, the signaling levels of the modems are in all cases just princely. But as it turns out, it is possible to pass digital data at the 64 kbps rate between the ISP and the telco central office switch such that at times, the output of the ANALOG line cards on the analog loop side — to the customer, drives a bit too far in amplitude — exceeding the analog signal levels mandated by the FCC Part 68 specification at no greater than -12 dBm averaged over any nominal three-second interval.

There has been some talk about pressuring the FCC to change this specification. Not likely, and here's why: The telephone company central office switches form a locus for a LOT of wire.

While they are spread out throughout the neighborhood everywhere else, they wind up in a "bundle" at the CO that might be a foot in diameter. In addition to ordinary local loop voice to the home, they can also include PRI ISDN lines, T-1 lines, HDSL lines, ADSL lines, 56 kbps leased data lines, and nobody seems quite sure what else.

A copper wire exhibits certain inductive characteristics when a varying signal is passed through it. Most notably, it acts as an antenna and transmits electric and electrostatic fields just like a transmitter — quite through the insulation actually. These fields are typically very small, but if you increase the signal level sufficiently, they can induce currents in wires that are held in close proximity to them. At the bundle, they are all in VERY close proximity. The result is that traffic from one wire can magically show up on another. This is termed crosstalk and there is much ado about Near End Xtalk (NEXT) and Far End Xtalk (FEXT) etc. in telco engineering circles. The FCC Part 68 rules limit signal strength in the bundle, and ostensibly crosstalk.

The problem shows up primarily when quantization points at extreme points in the constellation are selected in succession. In other words, if one symbol is transmitted in one point in the constellation, and the data to be transmitted maps to another point on the constellation that is far distant across the constellation, the signal change in amplitude directed at the D/A part of the CODEC on the subscriber side will be large enough to exceed the -12 dBm limit.

This can be reduced using an algorithm termed Shell Mapping. Everyone uses shell mapping anyway in modem technology and there are literally dozens of mid-fiftyish grey haired guys in modem companies all over the country that do this in the evening in front of the fire place like most of us do crossword puzzles. Come up with the next great shell mapping algorithm.

Lucent Technologies, in fact, claims that they have a technique termed "Level Learning" that allows them to achieve the full 56 kbps rate without exceeding the FCC part 68 specification. They also claim that they can perform some sort of CODEC synchronization that dramatically decreases noise levels. All inquiries indicate that none of this is born out outside the lab, and anyway it's all just a bit "secret" at this point, so we can't apply

much veracity to these reports. Lucent appears to be holding their hand close, and alluding to the possibility of an ace in the hole — a puzzling if tantalizing marketing concept at this stage of the game.

In any event, as newer higher speed data services show up in the bundle, and as competitive access to copper further removes any visibility that can be had as to just what IS in the bundle, the crosstalk problem can be substantial. It is unlikely the FCC will be particularly enamored of experimenting in this area.

So the FCC isn't being a big meany to US Robotics or Internet users. There are extremely good reasons for limiting signaling levels on 26 gage copper wire. And the modem manufacturers didn't just ignore this. The signals their equipment puts out are very much to proper specifications. It is an unforeseen anomaly that it is possible to transmit data strings that essentially drive the telco CO ANALOG line cards to exceed the specification.

There is another factor at play. As it turns out there IS a pretty substantial difference between PRI ISDN lines and channelized T-carrier lines. Some 24-channel T-carrier trunks use the least significant bit of each 8-bit sequence as a kind of subchannel to carry setup and administrative information. This is referred to as ROBBED bit and it reduces the channel from 64 kbps to 56 kbps. This has an ultimate effect on the performance of 56 kbps modems — a 2-4 kbps decrease typically. In this, ISPs that can get Primary Rate ISDN trunks will provide slightly better connections than those that get channelized T-1 trunks in some areas.

Affecting end users, there are two main variables. Line length is a pretty major factor. If you are four or five thousand feet from the CO switch, you'll usually do well. If you are 21,000 feet out, things won't look so well. Further, some telcos, BellSouth most particularly, have extended the reach of COs to newer suburbs using Digital Loop Carrier (DLC) substations. This is where they run a channelized trunk out to a neighborhood, and then do the conversion to analog there. Unfortunately, some of these also used robbed bit signaling — with the same effect. Fortunately, this effect is not cumulative. Wherever robbed bit shows up, it decreases the data rate, but additional links using the same technique don't worsen the situation.

## SHIFTS IN THE TIME LINE

Towards the end of last year, US Robotics appeared to have a significant jump on virtually everyone else — as much as three to six months. They had announced they would begin testing their remote access server upgrades with ISPs including AOL and IBM during mid-December and actually begin shipping working modems to the consumer on January 15th. Rockwell and Lucent appeared to be still designing chips and were months away from shipping samples to modem vendors, who then had to redesign and manufacture the actual modems. US Robotics looked unstoppable.

A couple of things have happened in the interim. First, US Robotics time line appears to have been a bit optimistic. Faced with the signaling level limitations and some reality zone test results, the company has been savagely tuning their software trying to raise the average connect speed out of the low to mid forties and get it into more salable high forties and low fifties. The bottom line is that their ship date of January 15th has slipped by over a month. CompUSA actually ran an ad announcing availability of the modems on February 16th. A sign in the stores noted that the product had been delayed until February 21 and offered a free 8 MB of memory for the inconvenience. Unfortunately, as of February 22nd, they STILL had no modems. US Robotics finally announced they were shipping on February 24th.

Rockwell, meanwhile, has pulled off one of the most impressive turn and burns we've seen in a large company since Bill Gatus of Borg pulled his "right turn Clyde" with Microsoft a year ago to focus on the Internet. In a February 3rd telephone press conference, Dwight Decker, president of Rockwell Semiconductor systems, announced the company was "bang on the schedule announced in September" and had shipped a few samples of their new K56Plus chip set to over 130 modem manufacturers during the final days of January, and would begin production shipments in February. They expect to have over 3 million chipsets shipped by June and be turning and burning at over a million chipsets per month at that point. Some 57 modem manufacturers have announced they will have product availability in March, an additional 57 manufacturers claim they will have products by the end of June, and 21 manufacturers have announced product availability before

the end of the year. The speed of deployment and the ramp up to quantity production appears unprecedented.

The Rockwell announcement did have a bit of a dark side. The company basically has developed FOUR different chipsets: two for the central site remote access server, and two for consumer modems. The chipsets being shipped in February/March are monolithic chipsets that are NOT upgradable in software. The FlashROM upgrade chipsets will be shipped approximately 30-45 days AFTER the availability of the monolithic chipsets. According to Decker, they see a great deal of price-point sensitivity in modem sales, and the upgradeable chipsets will be more expensive. He sees the non-upgrade modems priced at \$180-\$200 with the upgradeable versions more in the \$240 range initially.

This has some disturbing implications. It is true that customers are very price-sensitive to modems. But there is already sufficient confusion between the Rockwell/Lucent/Motorola/US Robotics camps. Now we have a single manufacturer with both a software upgrade version and a non-upgrade version. An ad hoc committee has been formed to develop a North American 56 kbps standard this summer, with probable publication in the fall. This will be submitted to the International Telecommunications Union late in the year, and the ITU could conceivably be expected to issue a standard by mid-1998, though it is not assured that they will do so. So ultimately EVERYONE will have to upgrade anyway. But it really is worse than that. In the rush to get to market first with something, everyone, including US Robotics, Lucent,

and Rockwell, will readily admit that they are still tuning the code furiously and that there could be innumerable incremental upgrades within their own camps. If you bought a modem based on a Rockwell chipset for example, and for some odd reason having to do with the second coming of Christ the ITU chose to implement their specific K56Plus as the standard unchanged, the chips Rockwell will be manufacturing a year from now are still absolutely guaranteed to have better code and work better than the ones shipping now. Decker does promise backwards compatibility in that anything they do in the interim will allow connections at 56 kbps with their current chips. But additional features, say for example some version of Lucent's 45/45 symmetric link, would require an upgrade.

We would rather predict that some customers, unknowledgeable of the issues, might indeed be persuaded by a \$40 lower price to buy a modem based on a monolithic chipset. And unless the modem manufacturers themselves pony up with generous upgrade programs at their own expense, these customers could be big losers in the development of 56 kbps modem technology even in the short term — never mind the ultimate upgrade that everyone will face 18 months from now.

In any event, the 3 to 6 month lead US Robotics appeared to enjoy has collapsed to less than a month — probably not a sufficient granularity to be meaningful in this market.

## EARLY OFFERINGS

And that may be the case. Internet service provides apparently see this as more of a market share element than a means to derive more revenues. While the average price in the early reports would appear to be a little over \$26 per month, many were announcing 56K connections would be available at the same price as existing 28.8 kbps dial-up accounts.

It may work out that way for modem vendors as well. To protect sales of existing 33.6 kbps modems, almost every vendor is offering "free" upgrades to 56K when it does arrive to those who buy modems now. For some, this is simply a software upgrade, but for

many vendors, these upgrades will involve some effort and in some cases some hardware — cutting considerably into margins.

US Robotics probably started the wave of free upgrades. Although they did price software upgrades of the remote access servers, these were essentially waved for ISPs that signed on prior to December 31.

Hayes Microcomputer Products has one of the more interesting offers in this area. The company is offering to upgrade ANY speed modem from ANY manufacturer to one of their new 56K modems for \$99 plus \$15 shipping and handling until June 30, 1997 — <http://www.hayes.com>. Hayes appears to be using Lucent chips in most of their product line.

On the server end, Livingston may be one of the more interesting offerings. This tiny company (\$48 million sales in FY1996 and 176 employees) has had an almost unnaturally large impact on Internet service providers. In 1990, they introduced their Livingston Portmaster device, a "dumb terminal" server that allowed ISPs to connect modems to a TCP/IP network. They also invented the Remote Authentication Dial In User Service (RADIUS) which allows ISPs to manage security, authentication, and ultimately billing for dial-up customers. Today, their PortMaster3 has been a popular digital remote access server product for ISPs with a very reasonable per-port cost and management software that most ISPs seem to grok fairly easily. The company has been touting "true digital" modems in this device for some time, referring to the digital/digital conversion taking advantage of digital trunks for some time.

On February 17, Livingston announced a guaranteed FREE 56 kbps modem upgrade for its currently popular PortMaster3 integrated access server. The PortMaster3 uses Lucent's DSP1674 Digital Signal Processor and a CSP1034 Codec with Flash memory allowing software upgrades. The upgrade will be available sometime in the second quarter of 1997 and is free to ISPs who register prior to June 30, 1997. ISPs can register at <http://www.livingston.com>.

We haven't received details of upgrade programs from Ascend, Cisco, and Cascade at this point. All three of these major players in the remote access server end use Rockwell chipsets.

## THE STANDARDS SITUATION

One of the items on everyone's lips revolves around the development of an International Telecommunications Union (ITU) standard. Rockwell hosted a meeting November 15th to get this process underway and a Telecommunications Industry Association (TIA) committee has already been formed — specifically the TIA TR30.1 PN-3838 committee for Pulse Code Modulation (PCM) Modems. It is expected to finalize recommendations by late summer and publish a North American standard in the fall. Meanwhile, the ITU Study Group 16 will have their first meeting in March 1997. We would expect the TIA standard to move to the ITU by the end of 1997 or early 1998 and by the spring of 1998 it could be all over. Historically, it would appear certain there WILL be a standard. The question is what does everyone do in the 12-14 months remaining until that happens. The answer: Anything they want to.

## QUESTIONS ARISING

The two questions of the day revolve around modem buyers and Internet service providers.

It is pretty much accepted at this point that the modem buying public will indeed spring a couple of hundred dollars for a new modem that delivers 56 kbps connections — IF they can persuade their Internet service provider to provide a compatible connection. What now becomes a bit of a question, is will they spring a couple of hundred dollars for a 56 kbps modem that actually looks, acts, and talks as if it were a 48 kbps modem? After all the 56 kbps hyperbole, no one at Rockwell or US Robotics quite knows how to drop the bad news that 56 kbps is a bit of an overstatement. Lucent rather coyly alludes to the fact that it still is, but is a bit reticent with details. US Robotics has begun, almost comically, to footnote their advertising in four point microscopic type — implying that it is somehow the FCC's fault.

The current 33.6 kbps modem market offers a bit of an analog. Internauts are buying a lot of them, and rarely getting 33.6 kbps connections. In some areas, largely it would appear as a result of the AGE of the copper in the ground more than any other factor, 28.8 kbps connections are exceedingly rare. But there is a school of thought that even customers with poor analog connections that cannot do 28.8 kbps might benefit from the new modem technology. We had stated rather strongly in the January issue that if you weren't getting 28.8 kbps now, the 56 kbps link wouldn't help at all. That may have been an oversimplification of the issues. The 56 kbps technology certainly will improve half the link, and it is possible that some improvement might be seen even in areas where 28.8 kbps is not the normal connection. 56K might well be a boon for everyone to some degree or another — just very rarely to 56 kbps.

Internet service providers are the other wild card. Still suffering memories of help-desk night sweats over the confusion regarding V.Fast Class and V.34 in the previous, relatively simple round of modem upgrades, many ISPs have announced with no small bravado that they will stoically await an ironclad standard before spending fifteen cents on new equipment. Actually, with the incredible investment in this new technology, if they could make that claim on some universal level, it would probably have at least a salutary effect on the players. Unfortunately, the ISP business has become even more competitive than the modem business. A handful of voice tele-

phone calls from inquiring customers terribly interested in higher connection speeds can quite quickly cause the knees to buckle on this one. If one ISP in a specific market trumpets the availability of 56 kbps, all of the rational technical explanations from cooler heads will simply sound like sour grapes and an impressive shift in local market share could be a *fait accompli* before anyone realizes the downside.

And frankly, the calls have already started before the modems were even available. This week, it is becoming apparent that there is almost a rush to the stores to get the new arrivals. So we didn't miss on this one. The 56 kbps modems are going to be popular with the rank and file dial-up customer.

We surveyed 3,640 Internet service providers for our March/April Directory of Internet service providers. The quest here was more to baseline what percentage had digital connections to the CO now, and what equipment they were currently using. We did ask how they planned to deploy:

Of 3,640 Internet Service Providers, some 54% (1969) currently have digital connections to the telco CO switch. Some 72% of those use channelized T-1, 47% use PRI ISDN, and 50.4% use Basic Rate Interface ISDN. Note that most use more than one of these types based on the availability of ISDN in some areas and not others, so the percentages quite exceed 100% in total.

We did add a column to the directory listing the monthly price of a 56 kbps connection. Some 452 ISP's (12.42%) did claim they already have plans to support 56 kbps connections.

### ISPs ANNOUNCING SUPPORT

NUMBER OF ISPs	TECHNOLOGY
348	76.99% x2 US Robotics
94	20.80% K56Plus Rockwell Semiconductor Systems
24	5.31% V.Flex2 Lucent Technologies
9	1.99% All

US Robotics was rather overwhelming among these early responders. We would guess this largely reflects the fact that most of those responding already use US Robotics remote access server equipment, and face an almost totally painless software upgrade to be able to support the move. Indeed, US Robotics was actually waiving all fees for those who signed up before December 31, 1996. Their strategy appears to be to foster support among ISPs, and they've done pretty well in getting the word out.

More interestingly, we asked 3,640 Internet service providers what type of digital remote access server equipment they had in place in their equipment rooms now. Some 2,026 responded, which upon investigation showed that a number have had better luck getting equipment delivered than had quite gotten digital trunks installed from the telephone company. This comprises some 55.66% of all ISPs. Noting that many ISP equipment rooms feature a sometimes bewildering mix of equipment from a variety of vendors, we gave them a list and asked them to check all that apply:

## DIGITAL REMOTE ACCESS EQUIPMENT

VENDOR	NUMBER OF ISPS	%	RELIGIOUS AFFILIATION	TECHNOLOGY
Cisco	979	48.32%	K56Plus	Rockwell
Livingston	860	42.45%	V.Flex2	Lucent
Ascend	841	41.51%	K56Plus	Rockwell
US Robotics	500	24.68%	x2	US Robotics
Motorola	190	9.38%	K56Plus	Rockwell
Bay Networks	143	7.06%	K56Plus	Rockwell
Microcom	95	4.69%	K56Plus	Rockwell
Multitech	61	3.01%	V.Flex2	Lucent
Hayes	54	2.67%	V.Flex2	Lucent
Shiva	38	1.88%	K56Plus	Rockwell
Cascade	23	1.14%	K56Plus	Rockwell
Lucent	20	0.99%	V.Flex2	Lucent

Cisco has been very strong with ISPs with routers and it appears when moving to digital remote access servers a lot of ISPs opt for the "dance with the one that brung ya" strategy. This can be seen with Livingston as well. Livingston was almost totally dominant in dumb terminal servers, devices that allowed ISPs to connect ordinary modems to analog telephone lines and connect them to a TCP/IP LAN directly. It would appear that in moving to digital remote access servers, the smooth upgrade path Livingston provided was persuasive. Ascend has been the comer of late with very flexible Max 4004 series products allowing ISPs to rather flexibly mix ISDN and analog call access in the same box. US Robotics claims about 25% presence in the equipment rooms now. It will be interesting to see if the x2 move increases that percentage. We found it surprisingly high — until we looked at ANALOG access.

Analog access we are defining as connections offered through analog POTS lines and ordinary modems. While some of these modems may be rackmounted, they are basically the same modems used by the dial-up customers. They are typically interfaced to the network with what is referred to as a dumb terminal server — again Livingston has historically been terribly dominant in this niche. When we look at the brand of modems favored by ISPs, the US Robotics presence becomes obvious. Some 2,040 or 56% of ISPs still have analog lines. Again, many ISPs use BOTH analog and digital connections in their Internet access stew.

## ANALOG ACCESS EQUIPMENT

MODEM BRAND	NUMBER OF ISPs	%
US Robotics	1261	61.80%
Microcom	355	17.40%
Hayes	308	15.10%
Multitech	256	12.55%
Motorola	249	12.21%
Supra	203	9.95%
Cardinal	166	8.14%
Practical Peripherals	146	7.16%
Computone	44	2.16%
ZyXEL	40	1.96%
Telebit	38	1.86%

As you can see, US Robotics is incredibly dominant in the analog end of the world almost entirely based on their Courier line. While the US Robotics Sportster has developed a poor reputation among ISPs, the Couriers are considered very solid performers under heavy use. Hayes Microcomputer Products is actually second as they produce both the Hayes line AND Practical Peripherals so between one and another they appear in 22.26% of the equipment rooms. Microcom and Multitech are also well thought of, but no one approaches a fraction of US Robotics market share on the analog side.

We are not very well equipped at Boardwatch to talk about end consumers. VisionQuest 2000 quotes market shares for the retail modem market.

## CLIENT MODEM MARKET SHARE

	FALL '95	FALL '96:	
US Robotics	22%	40%	x2
Hayes	15%	13%	V.Flex2
Best Data	10%	4%	K56Plus
Zoom	8%	7%	K56Plus
Cardinal	5%	6%	x2
Motorola	2%	7%	K56Plus
Diamond	0%	5%	K56Plus
Other	38%	18%	

This would indicate US Robotics rising from a 22% share to 40% in the past year. Cardinal with 6% also falls into the US Robotics camp, indicating nearly half of the retail modems sold in the past year have been made by manufacturers now introducing x2 modems. Anecdotally, we can easily look at the modem display at CompUSA and note that a little over half of all the modems stocked are US Robotics modems. Either CompUSA thinks they are selling a lot more US Robotics modems than anybody else, or US Robotics has sunk a lot of effort and money into the point-of-sale display area.

## CONCLUSIONS

The bottom line is that the three to six month lead US Robotics appeared to have has virtually nulled out into a nearly even confrontation on the time line. US Robotics appears to be shipping modems in the last week of February, and numerous Rockwell/Lucent vendors are vowing to ship by the end of March. So the three to six month lead appears to have shrunk to a month — a not terribly significant period.

Virtually the entire industry is gathering against US Robotics. Rockwell has done a magnificent job of aggregating industry consensus around the K56Flex subset as a *de facto* standard with Lucent, Motorola, and virtually every vendor onboard. ISP's that currently use Livingston, Cisco, and Ascend remote access servers will feel a little better that product is coming and they won't be exposed for months to competitors stealing market share. While US Robotics touts retail modem sales and ISP participation, Rockwell has gathered virtually the entire modem manufacturing industry except US Robotics and Cardinal into a reasonably cohesive force, all chanting that K56Flex is the way of the future. Further, they've turned their chipmaking machine on in an almost unprecedented scheduling feat.

But Rockwell has not given up on the concept of selling monolithic chipsets without upgrade features to an unsuspecting



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public. The impressive shipment schedule will be for monolithic chipsets without the capability to upgrade. The company will offer an upgrade set sometime later — reportedly 30 days later.

The 56 kbps modems will more likely deliver on the order of 48-53 kbps performance and nobody quite knows how to break the news after such a PR storm over 56 kbps.

Over half of Internet service providers can support at least one of the technologies by simply upgrading existing equipment once upgrades are available. They already have digital remote access servers and digital trunks to the central office switch.

We received a somewhat incredible response to our 56 kbps story in the January issue. I rather gather that if we could have gleaned 10 cents for each and every photocopy of this story wandering the halls of this industry, we'd have no economic need to ever publish another issue of Boardwatch. But there appear to be a couple of issues we should clarify. Some of the criticism revolved around our not "picking a winner." The article was intended to be introductory. We think this will be a major evolution in 1997. The article sought to introduce the

major players, and describe why 56 kbps could be done at all when the ubiquitously quoted Shannon's Law would appear to preclude it. We not only can't "pick a winner" at this stage, but are straining just to clarify the technical and business issues involved. If the winner were clear, there would be no controversy or battle. Ultimately our hope is that the end-user is the winner. But there are potential shifts in market share at all levels that have everyone preoccupied. But understand, the FIRST samples of 56K modems hit the store shelves this week. Ultimately, the buying public will indicate winners, if there be such.

Secondly, the article isn't the final word on anything. Again, it was meant to be introductory. We envision regular coverage of three issues in 1997 that will be crucially important to Internet service providers and the public as well. We intend to cover the 56 kbps modem story throughout the year and the very nature of the story will require us to correct ourselves almost monthly as we go along.

We also think xDSL will become very much in vogue. Rockwell Semiconductor Systems, as it turns out, has released a chipset supporting xDSL at distances up to 18,000 feet, and dozens of xDSL equipment manufacturers are appearing out of nowhere.

ISPs, once they discover they can get dry copper pair from telcos for as little as \$30 per month, will be all over this technology for those customers geographically close. This technology has been interesting for several years, but the 5000 foot reach rendered it virtually undeployable. At 18,000 feet, it begins to look usable.

Finally, we THINK finally, wireless technologies may offer some alternative to the local loop in 1997. Several companies have essentially wireless T-1 links now and we actually are hopeful for some product from Motorola and Lucent by the end of the year involving 20 Mbps unlicensed NII band wireless.

A redundant theme emerges — how to get around the local telephone companies hysterical pricing structures and deliver connectivity in spite of them. That this has been the mission of data communications technological development for twenty years now remains one of the most puzzling eccentricities of our age in my opinion. Precisely the people and companies that should have been enabling us, have instead in all cases comprised almost all of the barriers — thus spawning a huge industry devoted to getting around them. But around them we shall get, and we'll cover it blow by blow as best we can in these pages. ♦

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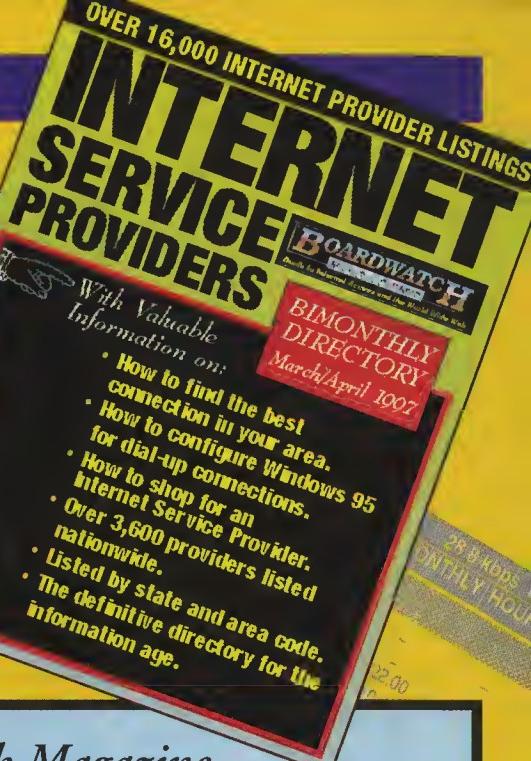
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**Guide to Internet Access and the World Wide Web**





Michael lives in Huntington, West Virginia, with his wife Jacqueline and Paxy Baby (Jackie's Shar-Pei dog). He has designed, built and administered network systems for over 16 years. Mike has organized and documented his 600-megabyte bag of tricks, tools and voodoo on a CD-ROM entitled, "The WebMaster's Resource." It is available for US\$24.95, plus US\$2.00 shipping in the United States or US\$5.00 elsewhere; send check or money order to 320 36th Street, Huntington WV 25702-1632. Please allow 4-6 weeks for delivery. For more information mailto: [mike@eve.net](mailto:mike@eve.net)

# PUBLISHING ON THE WEB

## PART 27 - PUBLISHING ON THE WEB

Back a few years ago, if I remember correctly, when Netscape 1.0 was in early beta, one of its developers named Rob McCool started talking about something called a "Server Push" and a "Client Pull." Last month we looked at the "Client Pull" side by using Meta tags, this month I am going to continue on the track of showing you that mysterious "server push" feature you occasionally hear about. This will get fairly deep rather quickly, so hang on.

As Rob pointed out, "Server push" was to complement the "client pull." In a nutshell, a server push uses an existing open TCP/IP connection with the user's browser to basically force feed the browser new or updated information. This allows the server to send updated information over the already open HTTP connection. This is more efficient in the short run, however, it does require more horsepower for the web server hardware. You are in effect keeping active various resources on the web server that would normally just send information to the browser, close the connection, and then wait for additional requests from the browser.

So how does this server push fit into the framework of the HTTP protocol? Well, normally a browser sends a single HTTP request to the server, the server returns that single piece of requested info. A server push tells the browser that it is sending a **MIME** message, and that's its secret to success. The MIME standards (**Multipart Internet Mail Extension**) state that, a message can be made up of multiple parts of mixed data types. Think about when you send **MIME** compliant e-mail with attachments. The body of the message travels across the net as text. But you might attach a **.WAV** file, MS Word document, or anything else under the sun. This is done by the use of **MIME**'s standard type of "multipart/mixed." You can see this for yourself in the **MIME** definition file on your mail server.

So in the normal e-mail instance, the client opens a **MIME** connection to a mail server. The server then tells the browser the following:

**Content-type: multipart/mixed;boundary=ObjectBoundary**

The client sees this content type of **multipart/mixed**. The boundary declaration tells the browser that when it sees "**ObjectBoundary**," and in real life this could be just about any defined string of characters, to start receiving another object inside of the one request.

The server then sends to the client:

**ObjectBoundary**  
**Content-type: text/plain**

This tells the client that it is getting ready to receive text, in a plain format. So far so good. Then the server starts sending the plain text to the client. This is the first part of the multipart/mixed data. Once the server finishes sending the data for the part, the server then tells the client:

**ObjectBoundary**  
**Content-type: audio/wav**

The client notes the **ObjectBoundary** string as the end of the text and the beginning of a new content type. Seeing the **Content-type: audio/wav**, the client readies itself to receive the **.wav** audio file. Then the server starts sending the **.wav** file to the client. This feature of **MIME** can be used to send a lot of various types of data to the client. The client keeps expecting to see additional objects, or more data, as long as it does not receive a closed boundary marker. In this simple example the closed boundary marker would be:

**ObjectBoundary**

At this point the client would close the connection to the server, because of the final double dashes on the above line. The client would be assuming that it had received all of the various parts of the **MIME** message.

That's all well and good, but we are talking web server pushes, not **MIME** e-mail — right? As it so happens, web servers use **MIME** objects to send data to browsers as well. So what we do to the web server is give it a slight change to the **MIME** type. Instead of the **MIME** type of "multipart/mixed," we use "multipart/x-mixed-replace." Basically, this is going to tell the browser, originally **Netscape v1.1**, that it is going to receive not only multipart/mixed **MIME** messages, but it is to replace the previous received data object with the new data object. That means to the browser, once it receives some new data which it has already rendered and displayed, that if it receives new data under that same definition, to render that information, and update the display. Virtually replacing the data.

What makes this interesting, is that the server does not send all of the various parts of the **MIME** data at once. Instead, the server sends the new replacement data at some interval. All the while keeping an HTTP connection open to the end user's browser. So the browser never receives the closing boundary statement. Potentially keeping the connection open indefinitely. Cool, huh?

How do you think so much of this cool stuff happens? Automagically?

So when does this update stop? Well, we already know one time, that is when the server sends the boundary close statement. Another way to get this update to stop is for the end user to click on the STOP button.

So let's put this info to the test. Look at the following UNIX shell script.

#### LISTING 1

```
#!/bin/sh
echo "HTTP/1.0 200"
echo "Content-type: multipart/x-mixed-replace;boundary=---ObjectBoundary"
echo ""
echo "--ObjectBoundary"
while true
do
echo "Content-type: text/html"
echo ""
echo "<TITLE>Welcome to Boardwatch Demo of Server
Pushes</TITLE>"
echo "<H1>Welcome to Boardwatch Demo of Server
Pushes</H1>"
echo "<P>"
echo "<P>"
echo "<H2>Processes on this machine updated every 10 sec
  onds</H2>"
echo "Current time here is:"
date
echo "<P>"
echo "<HR>"
echo "<PLAINTEXT>"
```

ps -ef
echo "--ObjectBoundary"
sleep 10
done

So this simple shell script will start running when someone requests it. Then it will start cycling through every ten seconds because of the "sleep 10" in the next to last line. However, since it is a UNIX shell script, guess what happens when the user breaks or stops the connection? Yep, the shell script keeps right on running. Oh aren't computers wonderful? They do just what you tell them.

So what we will want to do is actually implement server pushes with either C or PERL based CGI scripts. Server pushes written in either C or PERL will terminate if the connection to the process is broken — in this case when the user stops the reloads, when the connect is lost to the browser, or when the user goes on to another HTML document.

This is pretty neat. Simple, clean, and neat and possibly more efficient than that of a client pull. Why? Client pull opens a new TCP/IP connection with each operation and it can take as much as a second or more to open the connection. Server push uses a TCP/IP connection that is left open, so it is possible to have a better performing, smoother update where that is important. The penalty is that server push requires more resources of the web server machine. So you may want to think about using server pushes when the updates are going to happen fairly frequent, say every 10 seconds or less.

Now a possible additional benefit is the ability to force changes to inline images. This was once considered the way to do moving inline images. That changed when the gang at Netscape looked at animating GIFs.

In that case we just change the HTML tags that point to the image to point to the server push script instead. Like this:

```
<IMG SRC="http://www.boardwatch.com/cgi-bin/hummer.cgi">
```

Then we need the CGI code to move the images into the browser. For a simple C version of a server push look at Rob McCool's example called **doit.c**. It is shown here in Listing 2. In this example it sends GIF files to the browser. Making it look like we are sending an animated GIF. However, we are sending static GIF images that are being replaced.

#### LISTING 2

```
/*
 * doit.c: Quick hack to play a sequence of GIF files.
 *
 * Rob McCool
 *
 * This code is released into the public domain. Do whatever
 * you want with it.
 */
#include <sys/types.h>
#include <sys/mman.h>
#include <unistd.h>
#include <fcntl.h>
#include <sys/stat.h>
#include <stdio.h>

#define LASTCHAR 'j'
#define HEADER \
"Content-type: multipart/x-mixed-\
replace;boundary=ThisRandomString\n"

#define RANDOMSTRING "\n—ThisRandomString\n"
#define ENDSTRING "\n—ThisRandomString—\n"
#define CTSTRING "Content-type: image/gif\n"

int main(int argc, char *argv[])
{
    struct stat fi;
    char fn[32];
    caddr_t fp;
    unsigned char x;
    int fd;

    if(write(STDOUT_FILENO, HEADER, strlen(HEADER)) == -1)
        exit(0);
    if(write(STDOUT_FILENO, RANDOMSTRING, strlen(RANDOM
STRING)) == -1)
        exit(0);
    x = 'a';

    while(1) {
        sleep(1);
        if(write(STDOUT_FILENO, CTSTRING, strlen(CTSTRING)) == -1)
            exit(0);
        sprintf(fn, "images/A%c.gif", (char)x);
        if((fd = open(fn, O_RDONLY)) == -1)
            continue;
        fstat(fd, &fi);
        fp = mmap(NULL, fi.st_size, PROT_READ, MAP_PRIVATE, fd,
0);
        if(fp == (caddr_t)-1)
            exit(0);
        if(write(STDOUT_FILENO, (void *)fp, fi.st_size) == -1)
            exit(0);
        munmap(fp, fi.st_size);
        close(fd);
        if(write(STDOUT_FILENO, RANDOMSTRING, strlen(RAN
DOMSTRING)) == -1)
            exit(0);
        if(x == LASTCHAR) goto thats_it;
        else ++x;
    }

    /* This goto is Marc's fault. Marc digs goto. */
thats_it:
    exit(0);
}
```

This is a simple C program to display the following screen. You can see this script in action at Rob's page at Netscape [http://home.netscape.com/assist/net\\_sites/mozilla/index.html](http://home.netscape.com/assist/net_sites/mozilla/index.html). What you can't tell from this screen shot is that Mozilla, is rising from behind the N.

**Animate.c** is a server-push animation program which was derived from the **doit.c** code. It currently solves all of the limitations from the original code and also has a quick, temporary fix for the fileopen bug. Included is the Makefile associated with the program which you can modify to install Animate on your machine. The animate program still requires some knowledge of C in my opinion, for this reason we have also provided the animate program in Perl source code.

**Animate.pl** is the same server-push routine converted to Perl. I find it is more suited for novice programmers or perl hackers and it performs roughly the same.

Now if you want to do the same type thing with PERL scripts. Look at **animate.pl** by GlobalMedia Design Inc. This is shown in Listing 3.

In this listing you might need to change a couple of lines to get it to run in your environment. For example the very first line, will need to point to where you have PERL installed. Notice this syntax is for those of you running UNIX. You will also need to make some changes to Section 2 of this listing.

In Section 2, you point to the directory that contains the images by the use of **\$IMAGEDIR = "/usr/users/mikee/images"**

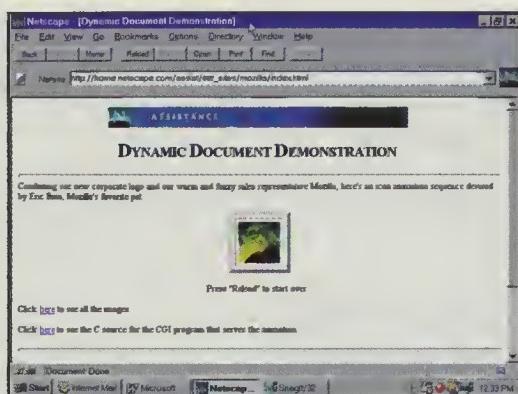
The **\$Continuous = 0** declaration tells the script not to run continuously. If I had set this to 1, then the script would run forever, or until the connection was broke or stopped.

Of course the **@images** tells the script the sequence in which to send what files. While **@sleep\_time = (4,2,2,2)**, tells the script to how long, in seconds, to sleep between sending each file. The **\$TYPE** statement declares what type of files are going to be pushed by the script. Notice that in section 1, you have 3 types, GIF, JPG and HTML. You could hack the script to add more types.

### LISTING 3

```
#!/usr/local/bin/perl
```

```
# ****
# Program: Perl Animation Routine (animate.pl)
# Author: Andrew Cowan
# Date: Aug. 23, 1995
#
# animate.pl (c) 1995 GlobalMedia Design Inc.
# This code is released into the public domain.
# ****
# Overall Concept derived from doit.c by Rob McCool
# doit.c (c) 1995 Rob McCool
```



```
# ****
# Some concepts derived from cycleim.pl by Brian Valente
# cycleim.pl (c) 1995 Brian Valente (which is released
# into the public domain, so long as this copyright
# notice is attached).
# ****
#
# Configuration1 - No Need to Change These
# ****
$ANHEAD="Content-type: multipart/x-mixed-replace;boundary=
ThisRandomString\n";
$BOUNDARY="\n—ThisRandomString\n";
$ENDBOUNDS="\n—ThisRandomString—\n";
$GIFTYTYPE="Content-type: image/gif\n\n";
$JPGTYPE="Content-type: image/jpeg\n\n";
$HTMLTYPE="Content-type: text/html\n\n";
$agent = $ENV{'HTTP_USER_AGENT'};

#
# Configuration2 - These need to be modified for your needs
# ****

$IMAGEDIR = "/usr/users/mikee/images";
$Continuous = 0;
@images = ("image1.gif","image2.gif","image3.gif","image4.gif");
@sleep_time = (4,2,2,2);
$type = $GIFTYTYPE;

#
# Main Routine
# ****

undef $/; # Undefine the perl input record separator.
$/= 1; # Force a flush on every print for the specified filehandle
(STDOUT).

# New browser check routine which excludes Mozilla/1.0
# while allowing Mozilla/2.0

$_ = $agent;
if ((/^MozillaV1.[1-9]/i) || (^MozillaV[23].[0-9]/i)){
    &animate;
} else{
    &single_image;
}

exit(0);

#
# Subroutines Declarations Section
# ****

#
# Animate - Routine to display server push animation
# ****

sub animate{

    print $ANHEAD;
    print $BOUNDARY;
    $count = 0;
    while(1){
        print $TYPE;
        $image_file = "$IMAGEDIR/$images[$count]";
        ($size) = (stat("$image_file"))[7];
        open(FILE, "$image_file");
        read(FILE, $image, $size);
        close(FILE);
        sleep($sleep_time[$count]);
        print $image;
        print $BOUNDARY;
        $count++;
    }
}
```

```

if ($count == $#images+1){
  if ($Continuous == 0){
    last;
    print $ENDBOUND;
  }else{
    $count = 0;
  }
}

# *****
# Single_Image - Routine to display a single image
# *****

sub single_image{

print $TYPE;
$image_file = "$IMAGEDIR/$images[$#images]";
($size) = (stat("$image_file"))[7];
open(TFILE, "$image_file");
read(TFILE, $image, $size);
print $image;
close(TFILE);

}

# *****
# End of Perl Animation Script
# *****

```

Well that is about it for server pushes this month. I want you to go explore this older technology. It is in many ways cooler and easier to modify than using some of the software that needs plugins and all kinds of other stuff to get the same effect.

Until next month..... ♦

## FOR MORE INFORMATION:

[http://www.cis.ohio-state.edu/htbin  
/rfc/rfc-index.html](http://www.cis.ohio-state.edu/htbin/rfc/rfc-index.html)

Andrew Cowan of GlobalMedia Design Inc, also wrote a much improved version of Rob McCool's doit.c, called animate.c. The C source code can be retrieved from the following URL:  
<http://www.radzone.org/tutorials/animatec.html>

## ISPs: LOOKING FOR A REMOTE ACCESS SERVER THAT IS FASTER, MORE RELIABLE, & LESS EXPENSIVE?

Look no further! Computone's IntelliServer *PowerRack* is exactly that! In comparison to Livingston's Portmaster, the PowerRack has a per port capacity of **921.6Kbps** (Portmaster -- 115.2Kbps), the PowerRack can support **16-64 PPP lines** (Portmaster -- 10-30), the PowerRack's average price per port is \$60 for 64 ports (Portmaster -- \$97 for 30 ports), and the PowerRack has a **5-year warranty** (Portmaster -- 1 year), FREE lifetime technical support and software upgrades, and a 30-Day evaluation option.

The PowerRack also has the standard feature list: dial-in/dial-out access, a powerful RISC CPU, Ethernet connectors, ISDN capability, PPP, SLIP, CSLIP, *bootp*, *rlogin*, *telnet*, reverse *telnet*, PAP/CHAP authentication, RADIUS II, RIP II, SNMP MIB II, subnet routing, IPCP DNS exts. for Windows 95, and IP filtering.

PowerRack user and Internet Service Provider Michael Behrens, of InterNet Kingston ([mbehrens@kingston.net](mailto:mbehrens@kingston.net)), commented, "The PowerRack is an attractive product, both in its ability to do the job well and to do the job... cost effectively. Port for port costs are significantly lower than the Livingston Portmaster. The product lives up to its name... performance under load is exceptional! The PowerRack also offers a significant feature for feature comparison against the available competition (i.e. Livingston Portmaster). And, technical support was extremely knowledgeable and responsive."



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# ISP TECH TALK

## STOPPING THE FLOOD

by Avi Freedman

Avi Freedman started Net Access, the Philadelphia area's original ISP, in October of 1992. Net Access is currently a regional ISP, with and more than 80 downstream Internet providers and dedicated-line customers, and thousands of dial-up and web-hosting customers.

Avi also is Cofounder of a new national ISP, Net Access USA, which focuses on dedicated connectivity for ISPs. For information, see [www.netaccess.net](http://www.netaccess.net).

Avi has been very active on the *inet-access* mailing list and is a vocal proponent of the continued viability of startup and existing ISPs. He is also on the ISP/C Board as Director at Large. ISPs can join *inet-access* by e-mail to [request@earth.com](mailto:request@earth.com) with SUBSCRIBE in the subject. Avi can also be reached at [freeman@netaccess.com](mailto:freeman@netaccess.com) or <http://www.netaccess.com>

If you notice that your servers are up, but that certain services seem slow or unavailable, then it's possible that you're being **SYN-flooded**. Any service based on TCP (as opposed to UDP) is vulnerable to SYN-flooding. SMTP (mail), NNTP (news), HTTP (web), and Gopher services are all vulnerable to attack.

TCP/IP services operate over "connections," and SYN-flooding programs send out many connection establishment requests (called "SYNs") per second, attempting to overflow the remote computer's "queue" of pending connection requests. Since the computer offering the TCP-based service has no way to tell the difference between forged and real requests, legitimate users are locked out of your TCP-based services.

### SYN FLOOD ATTACKS

In the Summer and Fall of 1996, code for a SYN flooding was published, first in an electronic hacker magazine, and then in print form by *2600 Magazine*. In order to generate devastating attacks, all you need is a UNIX box connected to a dial-up phone line. SYN flooding is called a "Denial of Service" (DoS) attack.

Other forms of DoS attacks can cripple computers and destroy data, but SYN flooding "just" renders Internet servers temporarily unreachable. Even so, if your business is web serving — or even simple delivery of mail to your users — a sustained SYN flood attack will put you out of business.

This past fall, Panix, the original dial-up ISP in New York City, was attacked repeatedly by SYN-floods. Luckily, Panix has a number of people who are very familiar with TCP/IP and UNIX, so figuring out what was happening didn't take very long. Working with Net Access in Philadelphia, some interim solutions were developed that held off the attacks and allowed normal functioning of the Panix servers, but it took many late nights and much wasted time. The Panix attack was the first widely-reported incident. Since then, hundreds of ISPs have reported slow or unresponsive servers due to SYN flooding.

Luckily, there are now fixes to almost every major vendor's TCP/IP code. You don't need to fix the web or mail server software — the fix is at the OS level.

### WHAT IS A SYN?

SYN is the abbreviation for SYNchronizing segment. It is the first segment sent by the TCP protocol and is used to synchronize the two ends of a connection in preparation for opening a connection.

Every TCP server application listens on a certain port (See Fig 1). That port, while the server is listening, has a queue of pending connection requests. Each client sends a SYN to the server, asking "will you talk to me?" If there is no server listening, then the OS on the server will send a packet back saying "No, go away" (a RST packet — the reset flag). If the server is listening and ready, it sends back a SYN-ACK (an acknowledgment of the SYN) to the client. When the client receives the SYN-ACK, it sends back yet another packet to acknowledge it (the ACK of the SYN-ACK). When the server receives this packet, it removes the SYN from the pending queue and sets up a TCP connection.

Figure 1

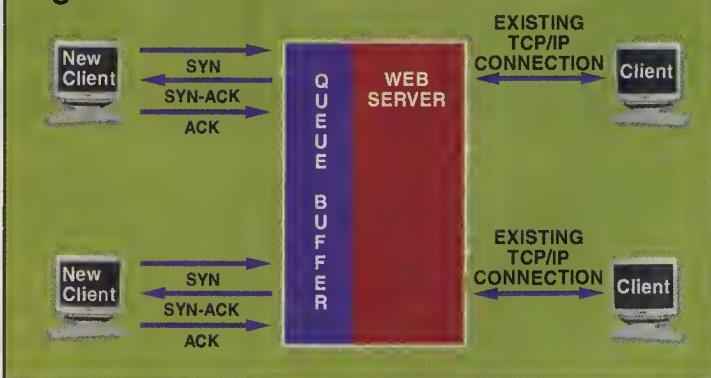
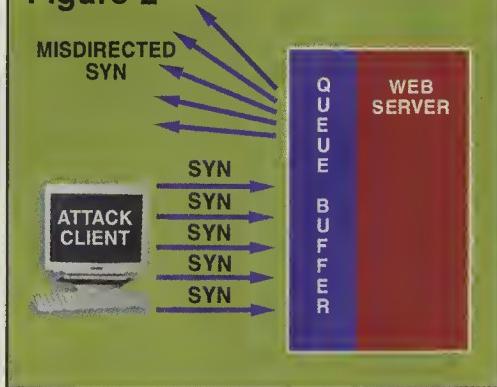


Figure 2



However, if the queue of pending connection requests (SYNs) is full, then new SYNs can't be entered and the client will just hang trying to connect to the server. It won't be refused or accepted, instead it will just wait until its SYN can get into the queue (See Fig 2).

## RANDOM SOURCE ADDRESSES

Every IP packet has a source address and a destination address. One key problem with Internet security is that source addresses are easy (if you have the right software) to forge. Much of the planning of the Internet involved the assumption that the actual machines on the net were large, monitored, and somewhat secure. However, everyone is "root" on their own Linux or Win95 machine, and anyone can easily pop a program in to generate nasty attack packets.

SYN-flooding from a host *without* forging the source address doesn't work well because:

- The server will send SYN-ACKs back to the SYN-flooding host, but the SYN flooding host will say, "Hey, nope, I didn't ask to connect to you." It will then issue a RST packet, which will knock the bogus packet out of the SYN queue on the server and lessen the effect of the attack.
- People can see the actual source address of the attack machine, filter those packets out, and try to find and prosecute the attacker.

But if the source addresses are forged, there's no simple way for the ISP being attacked to defend against the attacks — and tracking down the attackers is much more difficult. Unfortunately, most of the code out there does randomize the source address.

## HOW DO YOU KNOW YOU'RE UNDER ATTACK?

Presumably you're asking this question at a time when response from your servers is slow or nonexistent, yet the servers themselves seem fine when you log into them.

If you do a 'netstat -an | grep SYN' on a UNIX machine, it should show you the pending connections waiting in the **SYNRECVD** state. Note that not all of these are necessarily SYN attacks! A slow dial-up user, who is a few seconds away from you IP-wise, will show up as a pending connection request for a few seconds. If you see tens of connect

attempts to a particular service (port 23, 25, 110, 119, etc...) — in particular, from very random looking source addresses — then you have cause to suspect that you're being attacked.

## SO WHAT CAN YOU DO?

Well, it would be nice to get involved and try to find SYN-flooding attackers so that some can be caught and punished. But probably it's best to just fix your hosts so they're not vulnerable to SYN attacks, and go on with your life.

You can, if you want, contact your provider upstream and ask to trace the attacks. They may be interested in helping, or may tell you to solve the problem on your end. This might be intensely frustrating for you, as it was for Panix when they were attacked. When Panix was attacked, good fixes weren't available, and Panix couldn't get timely cooperation from either of their upstream providers to try to trace the source of the attack.

David Dennis, maintainer of the **inet-access** FAQ, has a SYN-flood FAQ at <http://cgi.amazing.com/internet>. While you're there, I strongly suggest that you look at the **inet-access** FAQ and join the **inet-access** mailing list, at least in a read-only mode. There's a lot of information flowing by, but technical and business issues of interest to every ISP are discussed (and re-discussed) on **inet-access**.

## DETAILS OF THE FIX

There are some simple approaches to fixing the SYN problem:

- Decrease the length of time that pending connections are allowed to sit around in the OS queues
- Increase the length of the queues (linked-lists, actually)
- Use better kernel data structures to store the list of pending connections

The standard UNIX kernels use 75 seconds as the hold time, and often limit the per-port list of pending connects to 10! Decreasing the hold time and increasing the list length (to a few hundred) will help in cases of attack, but it's not a perfect fix. Examples of how to do this under SunOS are available at <http://www.netaxs.com/~freedman/syn>.

If you're running BSDi, use David Borman's excellent fix, which uses a mix of approaches and is almost a total fix. Basically, it does nothing special when the machine is not under attack, but uses compressed and efficient data structures to store the pending connec-

tions when the machine is being attacked. You can find this patch at <ftp://ftp.bsdi.com/patches>.

Jeff Weisberg, of Op.net, coded the SunOS patch that many are using. It is a total fix for the SYN attack problem, since the kernel actually doesn't have any queues. A description of this fix can be found, with the fix itself, at <http://www.op.net/~jaw/syn.html>. At Net Access, we run this patch on all of our SunOS machines. There is also some source code for applying the same fix to any BSD-based kernel. It is available at <ftp://ftp.op.net/pub/src/synpro/phylactia>.

Also, some firewall vendors make fairly expensive "proxy" additions which actually protect your whole network by only allowing valid SYN requests through. These additions maintain queues, negotiate with the remote clients, and then do some mild spoofing to make it look to the client and server that the negotiation happened normally. Checkpoint's FireWall was one of the first to implement SYN defenses. A great description of Checkpoint's SYN defense approach is at <http://www.CheckPoint.COM/products/additions/syndefender>.

## YOU CAN HELP PREVENT ATTACKS

After Alexis Rosen of Panix made his hosts SYN-resistant, he started a campaign to educate other ISPs about preventing SYN attacks. A site being attacked can't block packets from random source addresses, but ISPs can block packets that have bogus source addresses. A router with "IP filtering" capability can do this with a very simple set of "filter rules." Basically, allow any packet with a reasonable source address (within your block of network addresses) to leave your network and deny others.

If all or almost all Internet providers put these filters into place, then it would be much more difficult for people to launch SYN-attacks, which would save everyone much time and effort.

Additionally, there are other known, but unimplemented, attacks which require being able to forge the source address — and some of these attacks have no known good defenses yet. Implementing outgoing "sanity" filters prevents your network from being used as a base for every type of forged-source-address DoS attack. Pointers to instructions for implementing these garbage filters on your router are available at <http://cgi.amazing.com/internet>. ♦



# Notes From The Underground

by Wallace Wang

## ACCESSING FORBIDDEN WEB SITES

Look in any bookstore and you can't miss the 400-page books that list thousands of web sites containing every type of information from mail-order companies selling ostrich meat to web sites dedicated to trivia about all the cast members of "Gilligan's Island."

While the Internet has fueled the hype necessary to raise Internet-related stocks to illogical extremes, it has also ushered in a new era where information on nearly any topic is not only free, but freely available to anyone with a personal computer and a modem.

Unfortunately, the free flow of information raises problems. Many countries such as China, Iran, Singapore, and North Korea prohibit their citizens from accessing information that contradicts "official" government news sources. These governments fear that allowing unlimited access to the Internet might "poison" their citizens with "corrupt" ideas about democracy, freedom, and other Western heresies best left undiscovered.

In these countries, citizens must register with the government to use the Internet, and even then only a select few are allowed unlimited Internet access. The majority of people are restricted to those portions of the Internet officially sanctioned by the government.

While blocking access to information might seem short-sighted, many of these Asian governments have a good reason to keep their citizens ignorant of the world beyond their borders. Since the fall of South Vietnam, the communist Vietnamese government still fears the thousands of refugees who have escaped and wish nothing more than to topple the current regime.

tion dedicated to exposing human rights violations and propaganda lies of the Hanoi government.



Other dissident activists have reportedly slipped banned information by e-mail into the Vietnamese computer networks and even clogged Prime Minister Vo Van Kiet's personal e-mail account with barrages of angry e-mail, thereby demonstrating an effective use of Spammering for political purposes. (See the December 1996 issue of Boardwatch for more information about Spammering.)

## GETTING BLOCKED WEB PAGES

For those poor souls living under a repressive dictatorship, the wonders of technology and the kindness of one man can still let you access forbidden web pages indirectly. Just send an e-mail message to [web@glr.com](mailto:web@glr.com) and type the URL of the web page you want as the first line of your message such as <http://pages.ripco.com:8080/~g1r/web.html>. Leave the subject line blank and then by return e-mail you'll receive your desired web page as HTML code. Just save it to a file and you'll be able to view it with your favorite web browser at your convenience. (Then you can copy and distribute it to others for everyone to see.)

Since most governments don't have the resources to exhaustively scan every e-mail message flooding their country everyday, this method will allow you to view web pages from anywhere in the world despite any government restrictions imposed upon you.

In case you're wondering who runs this service, visit <http://pages.ripco.com:8080/~g1r/web.html>. On this web page you can read about privacy advocate Glen L. Roberts, the host of The Net Connection, a radio show broadcast from Oil City, Pennsylvania every Sunday at 11:00 PM (EST) on WWCR or through IRC at "#netradio." Glen L. Roberts is offering his anti-web blocking service on a trial basis to determine its feasibility, so be sure to send him feedback and any thanks for his hard work.



One of the more Internet-savvy dissident groups includes The National United Front for the Liberation of Vietnam (<http://www.vinsight.org>), an organiza-

## DISABLING PARENTAL CONTROL PROGRAMS

While Glen L. Roberts' anti-web blocking service is geared primarily at helping people trapped behind the barriers of government restrictions, you can also use it to circumvent any parental control software that someone might have installed on your computer.

Parental control programs have the noble goal of allowing parents to monitor their children's Internet use and keep them from accessing pornography. To accomplish this, most parental control programs use a combination of banned web lists and URL scanning.

The banned web lists simply contain known web sites that the makers of the parental control program consider unacceptable for children to view, such as the Condom Country site (<http://www.condom.com>), the Playboy site (<http://www.playboy.com>), or the Hustler site (<http://www.hustler.com>). Since new web sites appear every day, publishers of parental control programs must constantly update their lists of banned web sites to maintain their program's effectiveness.

As a second form of defense, parental control programs also use URL scanning. So if you type in a URL that contains an offensive word such as "love," "sex," or "nude," the parental control program assumes the URL points to a pornographic web site and refuses to grant access.

Unfortunately, URL scanning is not without its flaws either. Some users can bypass parental control programs by typing in the numeric web site address rather than the more descriptive URL. Even worse, URL scanning can often block innocent web sites that contain suspicious words such as "hot," (such as a web site advertising hot chili), "girls," (such as a web site advertising Girl Scout cookies) or "X-" (such as a web site loaded with information about the X-Files television show).

To learn how to disable your favorite parental control program, visit the "Nurse Your Net Nanny" web page (also created by Glen L. Roberts) at <http://pages.ripco.com:8080/~g1r/nurse.html>. Here you can download a 1.5K program to

temporarily disable Cyber Patrol so you can explore the Internet without Cyber Patrol's supervision (interference).

If you are willing to dig into your computer's **CONFIG.SYS** file, then this web page also provides instructions for disabling Net Nanny. Or you can dig into your **WIN.INI** file and disable CyberSitter, another popular parental control program.

CyberSitter can be a nuisance in another way as well. Besides blocking your access to certain web sites, CyberSitter also tracks the web sites you do visit (and the web sites you tried to visit). Once again, the "Nurse Your Net Nanny" web page provides instructions for disabling CyberSitter's logging feature. That way if your parents check CyberSitter's log file, they won't find any traces that you attempted to access pornographic web sites.

While parental control programs work as advertised, they do offer a curious paradox. Since kids tend to understand computers better than their parents do, it doesn't take much to imagine that most parents won't be capable of installing a parental control program correctly in the first place.

Even more amusing is that parents can be deluded into believing that parental control programs alone can keep their children safe from forbidden web sites on the Internet. Given most children's fascination and endless patience with computers, it seems more likely that kids will find a way to disable or bypass any parental control programs that their parents try to install anyway.

Of course, this raises the crucial question about the moral issues surrounding Internet censorship. When it comes to protecting children from pornography, parents definitely have the right to decide what they want their children to see. But when it comes to keeping people (or children) ignorant for the convenience of an oppressive power, censorship in any form clearly has no place on the Internet.

Fortunately, knowledge of the Internet itself can help circumvent censorship of the Internet, so be sure to create a link to this article and pass it on. ♦

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# Java Jitters

by Doug Shaker

## DOUG DESIGNS PART OF HIS STOCK-PICKING PROGRAM

In my last column, we got together a minimal Java program, a sort of "Hello, World" program. However, instead of printing "Hello, World" to the screen, the program used a URL to go out over the net and get a web page back. We didn't do anything useful with the web page and we hard-coded the URL into the program, so it wasn't a very useful program - except that we had to code it and compile it and debug it and run it. But that was quite enough for my first session, thank you.

Doug Shaker is a free-lance technical writer in California. He has one wife, two children, three pets, and five computers. The computers are obviously out of hand. He can be reached via e-mail at <mailto:douge@theshakers.org>. Yes, that is a personal Internet domain. We told you the computers were getting out of hand.

I also announced that my eventual goal for the programming in this column would be to put together a neural net program that looks at stock prices and attempts to generate buy and sell signals. It's probably a stupid idea, but at least it isn't boring. This month, I would like to do a little bit of design for the data acquisition part of the program and then see if I can change that design into something that actually gets a quote from the net.

If you don't know anything about object-oriented design, let me give you a few books that are worth looking at. A good first book is *Designing Object-Oriented Software* by Rebecca Wirfs-Brock, Brian Wilkerson and Lauren Wiener (Prentice-Hall, ISBN 0-13-629825-7, \$48). Most OO design book give you a lot of mumbo-jumbo that might be good to put in a proposal or to talk about in a meeting with the bosses, but is pretty useless when it comes to figuring out what to do. This book describes an approach called CRC cards that is pretty close to what most people really do when they are trying to come up with a design — not how they write it up afterwards. Another, equally good, book on CRC cards is *Using CRC Cards* by Nancy Wilkinson (Prentice-Hall, ISBN 0-13-374679-8, \$29). Wilkinson's book is cheaper, easier to read and covers less. Take your pick — both are good places to start.

If you get one of those under your belt and you want a book that gives you a more formal background, including an ability to draw fancy diagrams, then the standard text is *Grady Booch's Object-Oriented Design with Applications* (Addison-Wesley, ISBN 0-8053-5240-2, \$55). Booch is the main design guru at Rational Technology - a company who has a near lock on OO design tools. The book is good, readable, and at the end you will be able to draw OOD diagrams that will be the envy of your cubicle pod.

Then, if you read those and you actually start doing object-oriented programming for a living, you will want to get two more books - *Design Patterns* by

Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides (Addison-Wesley, ISBN 0-201-63361-2, \$45) and *Working with Objects* by Trygve Reenskaug, Per Wold and Odd Arild Lehne (Prentice-Hall, ISBN 0-13-452930-8, \$48). Neither is light reading, but both are important.

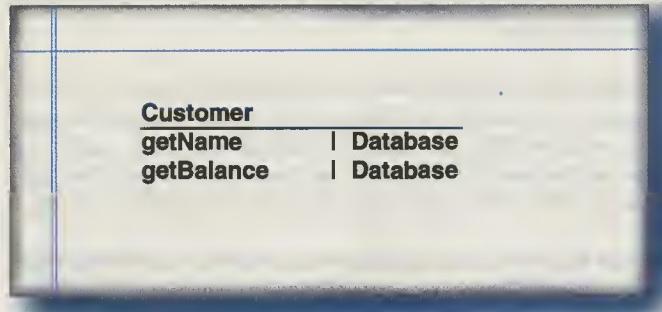
*Design Patterns* is a catalog of software design regularities and the situations in which they have been used. For each regularity, called a pattern, it states the situation in which the pattern occurs, the objects that were created to solve the problem and how the objects interact. The book won't keep you awake late at night with its spine-tingling plot, but it is great to have around when you want to do something in an object-oriented language but have no idea how to get it to work. When I'm stuck with an OO design problem, I browse through *Design Patterns* and pretty soon I have a pretty good idea what to do. Very popular and highly recommended.

*Working with Objects* is also not much of a page turner, but Reenskaug has been doing OO software programming longer than most programmers have been alive. When you get a large OO system going, you need additional abstractions besides class and instance if you are going to keep everything straight. Reenskaug explains the idea of roles and how they can be used to keep the complexity of OO designs to manageable levels. Important stuff if you are doing large projects.

Those books sketch out an ambitious self-education in object-oriented design. It might take you a year to finish all of those, what with watching basketball games, your significant other, taxes, dinner and all the other crap you need to do to remain an actual human. Meanwhile, I have a column to finish and a design to do, so let me teach you a little about CRC cards.

CRC stands for Classes, Responsibilities and Collaborators. The CRC cards are plain old index cards — 3" x 5" or 4" x 6", depending on how large you write — upon which you write (Surprise, surprise!) the class, its responsibilities and its collaborators. As your design evolves, you make one card for each class. The class name goes across the top of the card. Along the left side of the card you write the responsibilities - i.e. the things you want that object to do. These responsibilities are usually method names. Then, on the right side of the card, for each responsibility, you write the classes that this class will be working with to fulfill this responsibility. These are the class's collaborators. Collaborators may be classes that call this class or they may be classes that are called by this class.

A CRC card that looks like this:

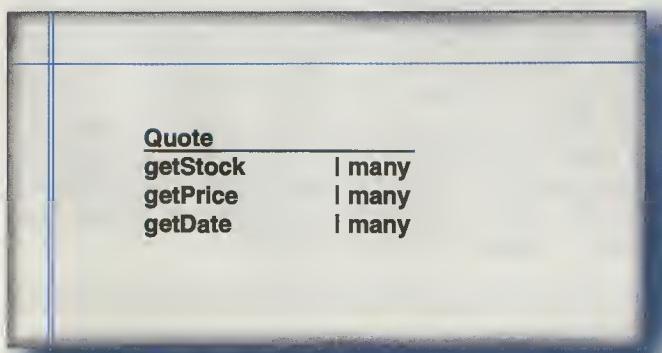


describes a class named **Customer** that had methods named `getMethod` and `getBalance`. It would appear that this information was stored in a database which was represented by a class named **Database**.

Right now, I am trying to design the part of my system that will get stock quotes from the net. Let's start with that — I know I will need an object called **Quote**. **Quote** will contain just a few bytes of data: stock symbol, price and date.

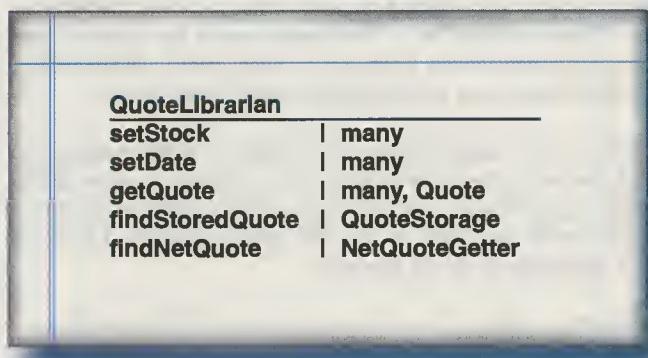
I will need methods that let me get at these morsels of information. Some OO languages let you get at that information directly, however, one principle of good object-oriented design is that we don't want other classes to know about implementation details for any other class. In this case, **Quote** is a simple structure, but we can imagine cases — a game, for example — in which the values which we get out of **Quote** are calculated. Other classes shouldn't be able to tell if the **Quote**'s price is hard coded, from a database, or calculated. To maintain this level of beneficial ignorance, you hardly ever (and usually never) access a class's variables directly. Instead, you call accessor methods that give you the value you require. These, being methods native to the class, have the option of getting the information anyway they need to, either through lookup, calculation, or another method. The opposite of an accessor function is a mutator function. A mutator function asks the class to change the value of something that was or could be gotten with an accessor function. Usually accessor functions start with "get" and mutator functions start with "set".

What this all boils down to is that we need three methods for the **Quote** class, `getStock`, `getPrice`, and `getDate`. The **Quote** class is pretty dumb, so it doesn't call any other classes. There will, however, be many other classes that call it for its information, so I just write "many" for the collaborators for the accessor functions. I don't think we will need mutator functions, since a particular quote's data won't change much and it will probably be set by whatever class creates the quote. The CRC card for **Quote** looks something like this:

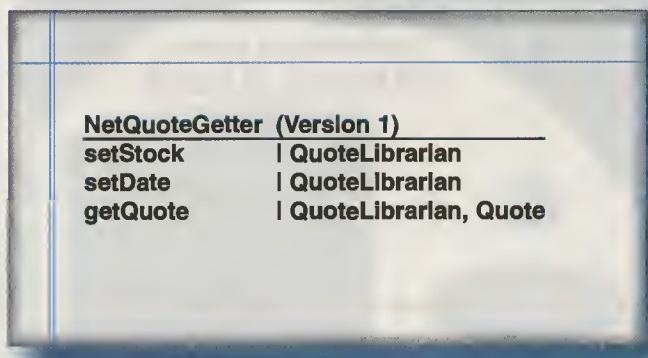


Then if you want, you can turn the CRC card over and write a narrative that describes the class a little and lists any internal details that you might want. Mine says, "Quote is the basic structure for quote information. Variables: stock, price, date."

Then, I need something to go get my quotes from the net. Let's call this a **NetQuoteGetter**. **NetQuoteGetter** is going to get an assignment from some other object, probably the **QuoteLibrarian**. **QuoteLibrarian** is the object that is going to keep track of the quotes we already have, on the disk, and what quotes we don't have. Other parts of the program will ask **QuoteLibrarian** for quotes. **QuoteLibrarian** will supply them from the disk if it has them and it will have some other object go get them if it doesn't have them.



When it needs a new **Quote**, **QuoteLibrarian** will ask **NetQuoteGetter** to get a quote for a particular stock and date. **NetQuoteGetter** will create a **Quote** object and give it back to **QuoteLibrarian**. **QuoteLibrarian** will then store it for later use. For this part of **NetQuoteGetter**'s life, the CRC card will look like:



The **QuoteLibrarian** will send **NetQuoteGetter** the stock, via the `setStock` method, and the date, via `setDate`. Then, when it is ready, **NetQuoteGetter** will send the **Quote** to anyone that asks, via the `getQuote` method.

But **NetQuoteGetter** will also need methods on the inside to get the quotes from the outside world. **NetQuoteGetter** needs to find out what source for quotes there are, construct a URL that will make the right request, send the URL, parse the result that comes back and then construct a **Quote** object to send back to the requester. This means that the final CRC is going to look something like:

NetQuoteGetter (version 2)	
setStock	QuoteLibrarian
setDate	QuoteLibrarian
getQuote	QuoteLibrarian, Quote
findSources	NetQuoteSource
askNetSource	java.URL
parsePage	NetQuoteSource

We have apparently found a new object called NetQuoteSource. There should be a NetQuoteSource for each of the places on the web where I can get a stock quote. There would be one for Etrade, one for Charles Schwab, and so on.

Now, if I ran the usual column, this design would be complete before I started to describe it, but I try to give you a view of the thoughts I go through and the mistakes I make in trying to learn this stuff. As I look at the CRC card up there, I have to admit I am starting to get confused.

Somewhere in here, I have to make up a URL to send over the net. That URL is going to look to the stock brokerage as if it came from a web browser, even though it really came from my application. I will need to paste the stock symbol and date into the middle of some long complicated URL that probably evokes a CGI program on the other end. I was planning on having the NetQuoteGetter get the prototype URL

from the NetQuoteSource, paste in the symbol, send off the URL, then parse the result, using a filter that I also got from Net-QuoteSource.

This seems silly. NetQuoteSource has all the information it needs - the mask to make up the URL and the mask to parse the page that is returned. Why shouldn't it make up the URL, send it off and parse the result? Well, once the question is asked, the question seems silly. NetQuoteSource should be doing all that work.

I still like the idea of one object for each source. I can't design this thing to live off of just one source, though. Sources will go bad - they will change their CGI program, they will change the format of the response page, they may change the name of the page or even stop giving out quotes all together. Some object needs to keep track of these sources. Until proved otherwise, I'll say that NetQuoteGetter should know which NetQuoteSources there are. I'll also say that each NetQuoteSource should know its own status, i.e. it should be able to look at itself and find out if it is any good. This leads me to CRC cards that look like:

NetQuoteSource	
setStock	NetQuoteGetter
setDate	NetQuoteGetter
getQuote	NetQuoteGetter, Java.URL
getSourceStatus	NetQuoteGetter

NetQuoteGetter (version 3)	
setStock	QuoteLibrarian
setDate	QuoteLibrarian
getQuote	QuoteLibrarian, Quote
knowNetSources	self
askNetSource	NetQuoteSource

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OK, so going over the use scenario, some other part of the program will ask QuoteLibrarian for a quote or list of quotes. QuoteLibrarian will look in storage to see if it has the requested quotes. If it does, it will supply them from storage. If it doesn't, it will ask NetQuoteGetter to get them from the net. NetQuoteGetter will see which sources are available and then ask them one by one until it gets an answer. Each NetQuoteSource, when asked, will construct a URL for a page, send the URL to the net, parse the result, and then supply the Quote object to NetQuoteGetter. If the resulting page from quote-supplying web servers is unparsable, NetQuoteSource will set its status to something negative and return some error code or exception. Seems reasonable.

Next month, I'll try to get Java software for each of these classes working. ♦

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# MANNING THE WIRES

by Ric Manning

**CONSUMER ELECTRONICS FIRMS ARE PILING ON BEHIND WEBTV**

I can't fault America's consumer electronics companies for jumping on the WebTV bandwagon. After all, they haven't had a big hit product since the early days of the VCR, the CD player, and Nintendo. And, like almost everyone else, they seem to see the Internet as the road to riches.

And the concept seems so logical: Put the World Wide Web on a 27-inch TV where average folks can get at it. Instead of forcing them to use an alien device like a keyboard, let 'em surf the way David Sarnoff intended — with a remote control.

That was clearly the attitude in January at the Winter Consumer Electronics Show in Las Vegas, the big annual trade show for audio, video, and electronic gadget manufacturers and dealers. It seemed like every company there had some sort of Web-surfing device either in production or on the drawing board.

Sony and Philips, of course, were pushing the WebTV (<http://www.webtv.net>) set-top boxes that the two companies rolled out late last year and both companies were crowing about their popularity. Sony said it got 12,000 calls the week before Thanksgiving from people who wanted information about WebTV and directions to the nearest dealer. Philips said it was having no trouble getting the full \$329 list price for a device it calls the Philips Maganavox Internet TV Terminal.

Other companies, lining up to join Sony and Philips in the Internet TV business, were bubbling with enthusiasm. "We have an opportunity to reinvent television," said Jim Meyer, executive vice president of Thomson Multimedia (<http://www.thomson-multimedia.com>).



Thomson and Zenith both announced at the show that they would use Oracle's Network Computer (<http://www.nc.com>) technology to create Web-ready televisions. Oracle CEO Larry Ellison and his Network Computer concept may not be getting much respect in the computer press, but it had plenty of supporters at CES. Akai, Funai, and Proton have also announced plans to use the Network Computer platform.



The television manufacturers will also be lining up Internet service providers that promise to customize the Web for television audiences. And Microsoft took the occasion to announce a new software developer's kit that lets developers blend TV video with Internet data.

It's not hard to get caught up in the Gold Rush mentality surrounding Internet appliances. A survey last fall by Yankelovich Partners Inc. found that consumers who do not already have Internet access — and that's still a lot of people — would prefer to go online using their televisions.

But there are still plenty of skeptics — me among them — who think WebTV will be another big bust like the mini disc, digital audio cassettes, and virtual-reality goggles.

There are some fundamental differences between TVs and computers that the WebTV model doesn't overcome. Think about it. We *watch* television and *use* a computer. One is very passive, the other highly active.

Watching television is a lot like watching a movie. We sit five or 10 feet away and watch moving images. There's seldom anything on television that we have to read and when there is, like a list of school closings in a big storm, they put it in real big type.

Browsing the Web on a computer is more like reading a magazine. The words and pictures are about 18 inches away and, for the most part, they stay put. Computer monitors are designed to make reading text and finely detailed graphics as pleasant as possible. Today's TV picture tubes are made to show moving pictures with very little detail.

Some people will argue that the Web is starting to look a lot like television. Sites like Disney's Web home (<http://www.disney.com>) feature bright and bold graphics, some of which would look good on a TV screen.

But most popular sites require a good bit of reading. People click in to Hotwired (<http://www.hotwired.com>), Time-Warner's Pathfinder (<http://www.pathfinder.com>), ZDNet (<http://www.zdnet.com>), ESPN SportsZone (<http://espn.sportszone.com>), and the Wall Street Journal (<http://www.wsj.com>) because they want to read the articles, not watch the bouncing icons. Yet reading anything other than headline-sized type on a TV screen is sure to give you a headache.

Anyone who used an old Commodore 64 or Apple II with a television for a monitor will remember how bad it was and how happy they were to get that first VGA monitor.

Ric Manning writes about business technology, computers and consumer electronics for *The Courier-Journal* in Louisville, Ky. His weekly column called *Home Tech* is distributed to more than 80 newspapers by the Gannett News Service and it's available on the World Wide Web <http://iglou.com/gizweb>.

Ric was the founding editor of *Plumb and Bulletin Board Systems*, two newsletters that covered the BBS arena in the early 1980s. His freelance work has appeared in several magazines including *PC/Computing*, *Mobile Office*, *PC Week* and *Home Office Computing*. Ric lives in Southern Indiana with his wife, two children and a champion Weimaraner. Write to Ric at <mailto:ricman@iglou.com>.

All of these distinctions, however, seem lost on the TV companies. They're lining up to bring the Web to the great unwired masses. Here's a brief look at their plans:

## RCA

Last June RCA announced a partnership with Compaq to produce a multimedia computer/television hybrid, something along the lines of Gateway 2000's Dimension system. The company says those plans are still on track, but meanwhile it also wants to bet on the Internet TV concept. It announced a deal with Oracle to produce a set-top Internet box. The device will come with a wireless keyboard and sell under the RCA, GE, and ProScan labels for about \$300.

Internet service will be provided by NetChannel Inc. (<http://www.netchannel1.com>) of San Francisco. NetChannel says its mission is to "select relevant, useful, personalized content from the extensive information available on the Web, format and organize it, and then deliver it to individual viewers at home, on their televisions."

In a press release, NetChannel CEO Philip Monego put it another way: "We . . . do not believe that the family room is the domain of Internet navigation or exploration. TV viewers want to have an entertaining and informative experience on their television, not be intellectually challenged by it."

## ZENITH

Zenith is another TV company that had different plans six months ago. Back then,



Zenith said it would work with Diba Inc. (<http://www.diba.com>) to bring the Web to Zenith TVs. Now Zenith says it will work instead with Oracle's Network Computer to have a set-top box on the market by the middle of this year. Zenith said it will use Netscape's Navio Internet TV browser.

## MITSUBISHI

Diba's current sweetheart appears to be Mitsubishi, which said the two companies plan to produce a line of "information appliances" that could sell for less than \$300. Unlike a multi-purpose PC, an information appliance would do single tasks

such as order groceries, manage recipe files, organize personal finances, or send and retrieve electronic mail.



While it's cooking up a kitchen computer, Mitsubishi says it will produce 32-, 36- and 40-inch televisions that have technology to access the Web built in. Mitsubishi said its Internet provider will be ViewCall (<http://www.viewcall.com>), a company that packages online information service specifically for TV viewers. ViewCall's service includes e-mail, a parental control option, and customized information from Web publishers such as Yahoo.

Like its TV competitors, Mitsubishi is convinced that TV-based Internet is here to stay. David Broberg, the company's manager of new technology and research, told one trade magazine that Mitsubishi believes that within three years, Internet access will be as common on high-end big-screen TVs as picture-in-picture. ♦

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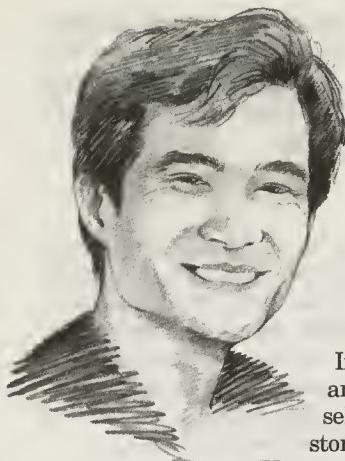
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# BIG BOARD BRIEFS

by Wallace Wang

## AOL DEBUTS COMPUTING SUPERSTORE

In another effort to keep subscribers happy and to hopefully raise more money for themselves, America Online has opened an online storefront called the Computing Superstore

(Keyword: Computing Superstore), which features more than 25,000 products from some 1,000 manufacturers, including more than 1,500 downloadable programs from atOnce Software Inc. (<http://www.atoncsoftware.com>) To encourage people to buy online, the Computing Superstore offers a money-back guarantee on all items purchased.



Of course, America Online is hoping that the Computing Superstore will attract advertisers who can target their banner ads by product type. That way people browsing for computer hardware might see ads from IBM or U.S. Robotics.

But should you risk sending your credit card number through America Online? Since that's a question likely to stop potential shoppers, America Online plans to use CyberCash technology, which provides secure credit card authorizations.

While America Online is banking on advertising revenue to make up for its rising costs of supporting unlimited flat-fee access plans, don't expect it to make a profit any time soon. Prodigy tried to rely on advertising and look where it is now.

### PRODIGY DEFEATS CYBER PROMOTIONS

E-mail marketer Cyber Promotions Inc. (<http://www.cpmall.com>) has lost its third legal battle with a commercial online service. After losing court battles to America Online and CompuServe, the Philadelphia-based mass-mailer recently lost another court decision to Prodigy.

In return for sending unsolicited e-mail to Prodigy subscribers and falsely claiming its advertisements were sent by Prodigy itself, Cyber Promotions must pay Prodigy an undisclosed sum in damages.

"Prodigy will continue to defend its brand, its image and its name against any entity attempting to associate [its] name with unsolicited e-mail advertising," said Marc Jacobson, general counsel for Prodigy, in White Plains, N.Y. So if you're planning to spam Prodigy, CompuServe, or America Online, be careful. They can afford more higher-priced lawyers than almost anyone else.

### NEW TROJAN HORSE ON AMERICAN ONLINE

If you're an America Online subscriber, beware of anyone offering to give you a beta version of a new BlackJack program for RabbitJack Casino. To entice people to download the program, the offer promises free online time.

The program appears under the file name "BJSETUP.EXE," and is actually a Trojan Horse program designed to obtain your password, e-mail it over the Internet without your knowledge or consent, and then proceed to erase files on your hard disk. By doing this, the Trojan Horse program tries to hide the fact that it has just stolen your America Online password.

If you run across this Trojan Horse, America Online asks you to click the Forward button and send the suspicious file to screen name TOSEMAIL1 so that America Online authorities can track down the perpetrators. Then delete the e-mail to protect your computer.

### COMPUSERVE NOW OFFERS NICKNAMES

For years, CompuServe members have just been a number, being forced to use weird User IDs consisting of strings of numbers separated by a comma such as 70334,3672. While America Online and other online services allowed members to pick nicknames for themselves, CompuServe members had no such option.

But now CompuServe has finally caught up to the rest of the online community. You can now pick a nickname for your CompuServe e-mail address. That means your friends, colleagues, and family can contact you through an easy-to-remember personal address, or through your traditional numerical User ID. Just tell your friends to replace your User ID@compuserve.com with your Personal Address@compuserve.com (such as both-ecat@compuserve.com).

To pick your CompuServe nickname, use the GO REGISTER command and get creative. Just don't forget your User ID because you still need it to log on to CompuServe.

## AMERICA ONLINE BANS RUSSIAN USERS

According to Russia's Itar-Tass news agency, America Online has temporarily halted access to its service for all Russian members. Apparently too many Russians were using fake credit card accounts to gain access to the system, forcing America Online to shut down the system completely.

No word yet on when America Online plans to re-open Russian access, but if you're a Russian (or anyone else for that matter) looking for Internet access, now might be a good time to look for an alternate Internet service provider and forget America Online altogether.

## PRODIGY OFFERS INSURANCE SERVICES OVER THE INTERNET

Prodigy has teamed up with Coverdell & Company to create Prodigy RightQuote (<http://www.rightquote.com/prodigy>), an insurance information and shopping service that allows anyone connected to the World Wide Web to shop for and purchase term-life insurance online.

With Prodigy RightQuote, you can shop for the best term-life insurance deals, get more information on what the heck term-life is (and why you

might want it), and even use an interactive calculator to determine the type and amount of life insurance you might need. (Then again, if you're dead, will you really care?)

Type in some information about yourself and Prodigy RightQuote provides you with an immediate quote for life insurance, from over 60 insurance products, and displays the five lowest priced products. From there, you can get more information about insurance carriers and their policies and even purchase a policy.

Best of all, you don't have to listen to some insurance salesperson drone on about protecting yourself and then confuse you with options that you probably have little interest in understanding anyway. By shopping for insurance through Prodigy RightQuote, you just might find yourself saving money on insurance, so you can use your extra money to enjoy yourself while you're still alive.

## COMPUSERVE 3.0 FOR THE MAC IS HERE

After releasing their fancy CompuServe 3.0 for Windows 95/NT back in December, CompuServe has finally delivered CompuServe 3.0 for both the 68K Macintosh and PowerPC. But before you get your hopes up too high, CompuServe 3.0 for the Mac needs at least 11 Mb of RAM (16 Mb recommended), at least 30 Mb of hard disk space, and System 7.0.1 or better.

If you're still limping along with an older Macintosh, stick with MacCIM 2.4.4. But

if you want the slick new Windows 95/NT interface, contact CompuServe and request a copy of CompuServe 3.0 for the Macintosh as soon as possible.

Pssst, in case minor bugs in the original CompuServe 3.0 program have been driving you mad, Windows 95/NT users can also grab the brand new CompuServe 3.0.2 while Windows 3.1 users can use the new CompuServe 2.5.1. If you happen to buy a new computer with the latest version of Windows 95 on it, dump the (slightly buggy) version of CompuServe 3.0 and replace it with (the fixed version of) CompuServe 3.0.2.

If you don't know what version of CompuServe you're using, just look at the opening screen when you load the program, or click the About command under the Help menu.

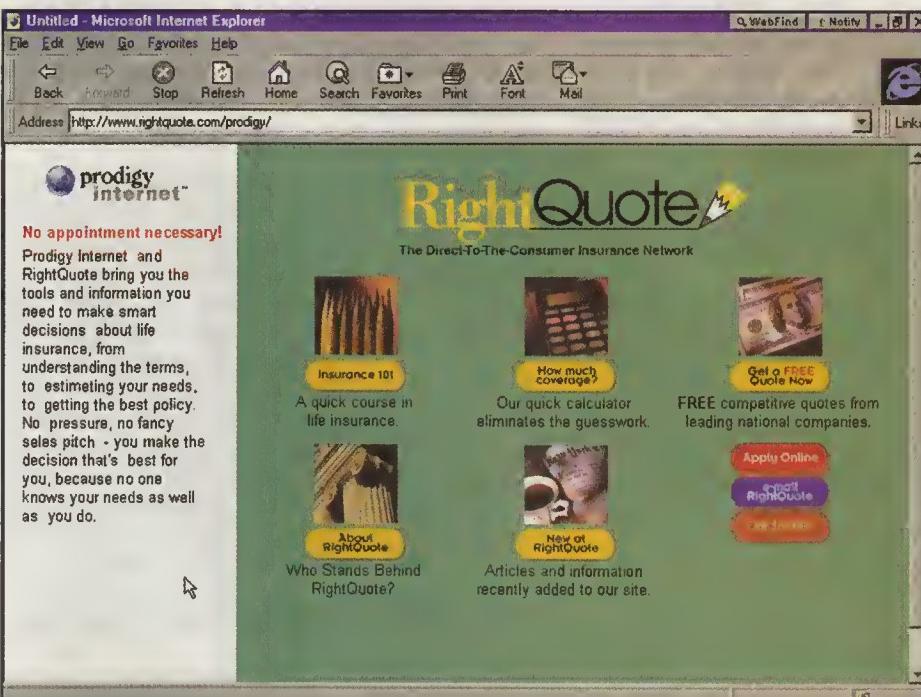
## AMERICA ONLINE HIT WITH LAWSUITS

America Online seems forever destined to disappoint. After unveiling its \$19.95 flat-rate subscription plan, America Online has been flooded by members trying to use the system – and getting only busy signals or disconnected in return.

In response to the increasing frustration of paying a monthly fee to access a service they can't use, members in Los Angeles, New York, and Chicago have filed lawsuits, charging America Online with fraudulent and malicious representation. The class-action lawsuit aims to cover all individuals who subscribe to AOL's unlimited \$19.95 monthly service. It claims that America Online's unlimited-usage promise is meaningless and seeks punitive damages for subjecting members to "unjust hardship."

In addition, New York state Attorney General Dennis Vacco and Wisconsin state Attorney General Jim Doyle are in discussions with America Online to resolve the current crisis. It seems like no matter what America Online does, it always manages to find a way to make its members mad, from deleting e-mail written in foreign languages (because its system couldn't verify people weren't writing dirty messages to one another) to threatening to cancel member accounts who visit special "hacker" chat rooms that America Online does not like but still keeps open for members to visit anyway.

America Online might offer the easiest interface to the Internet, but it also offers comic relief every month or so in its continuing efforts to prove it really doesn't have a clue how to serve its customers. ♦





# CYBERWORLD MONITOR

## SECRETS OF APPLE'S NEW CORE STRATEGY

Frank X. Sowa

Frank X. Sowa is president of The Xavier Group, an international consultancy providing strategic planning, forecasting, training, and development of business and communications systems for organizations since 1981. As a certified software consultant for Softarc's First Class, and a reseller for other companies, he configures customized BBS systems for organizations, complete with "regular content updates." Sowa is also founder and sysop of SEED.NET (412) 487-5449, "the online incubator" for small businesses, a seamless BBS-to-Internet (PPP) provider, with business start-up assistance and seed capital available online.  
<mailto:franksowa@aol.com>

In the world according to Apple Computer, there is no operating system (OS) better than the Macintosh Operating System, and of course, no better platform than the Macintosh PowerPC. At least, that's the public message. Anything else might hinder sales at a critical juncture in the life of the company. And, it is in defending that public posture that Apple seems to be withholding a clear vision of its future, and thereby confusing Wall Street and its customers.

Apple does, in fact, have a private vision that is different — a vision that will eventually please shareholders. After trying forever to get through to senior management at One Infinite Loop, hoping to get a good pulse on what Wall Street (and the publisher of Boardwatch) have seen as a "dying" patient, I have found evidence of a radical strategy to return Apple to a successful and healthy future. (If only its shareholders give it enough time to change course.)

The plan is this: By 1999, Apple intends to shift its core strategy from primarily supporting PowerPC-based Macintoshes to "opening" the environment, as chairman and CEO Dr. Gil Amelio likes to refer to it. It will do so by redesigning Apple software from the ground up primarily around a "UNIX kernel." This new software will run on PowerPC, Intel, Alpha, Cyrix, AMD, Exponential, and Sparc CPUs. Further, Apple intends to abandon its proprietary Mac kernel forever, while grasping on to an entirely new paradigm for what an operating system actually is — a paradigm based on "the success of UNIX and TCP/IP in an Internet-connected cyberworld."

### APPLE SHIFTING TO BE A KEY PLAYER IN THE INTERNET SERVER MARKET

Furthermore, Apple sees its future solidly in the business enterprise, Internet / Intranet market which, in the new vision, will actually replace most of traditional desktop computing after the turn of the century. As Amelio sees it, "The Internet and Intranet are driving a new enterprise computing environment — one that combines the media-rich qualities of the World Wide Web with the established infrastructure of industrial-strength corporate networks. This is where Apple plans to go in the future."

In the educational, design, and multimedia markets where the Macintosh dominates, Apple sees a more interconnected world of neophytes on the horizon — where today's UNIX and Windows NT programs take

too much time to master. In this new world an intuitive UNIX software combined with the best features of the Mac OS will prosper.

Apple's strategic plan is dynamic — and of special interest to network-centric software developers, and to ISP and network administrators — who Apple is just beginning to woo to its product lines.

Consumers currently hooked on the Mac OS will be delighted to see the same elegant, intuitive and easy-to-use interface kept intact. They will also see high-end capabilities added to run most of their current applications with preemptive multitasking, multi-threading, and symmetric multiprocessing. They will also delight in the capability to run a lot of UNIX and PC-based applications.

UNIX users may see a more user-friendly Mac interface with the strength of their preferred OS. Even Windows users might see benefits. The market may also finally see a credible alternative to the Wintel empire — an "open" desktop environment which is OS independent. The question now remains — can Apple pull it off?

### THE DEVIL IS IN THE DETAILS

It will not be easy. There are a lot of details to work out. And, there are even more problems to overcome. Apple is teetering on the brink of disaster. Even loyal supporters are having second thoughts and some would say that it is already too late.

Apple is bleeding badly — with little in terms of profits to look forward to in 1997. Worse, it is being beaten by an unforgiving and narrow-minded press and by fickle investment stakeholders. Internally, Apple's marketing continues to miss the mark. Its public relations approach continues to be arrogant and closed. And, its sales, licensing, and cloning approaches continue to be obscure. As I write this, all these departments have had their executives replaced. It was the right move that should have been done a year earlier. Now, the new hirelings in all of these areas will have to move swiftly and make absolutely no major mistakes if Apple is to survive. Another misread of the market in 1997 will most likely put Apple out of business.

### MAC ADDICTS MISSING THE PARADIGM

In addition, Apple has another looming problem. Mac addicts are having trouble understanding the new

Apple paradigm. Some are abandoning ship. Even the Macintosh trade press is mixed up when it tries to make sense out of how the current Mac OS might be merged with NeXT Computer's Nextstep to create the new hybrid — that is essentially still a Mac. Their criticism of Apple — saying that they shouldn't rush to market a System 7-hostile software — is poor advice and unfounded. Apple should. It must. And I think it will. But it must also continue to support System 7 — and that's part of the plan.

The fact is, that after you explore beneath Apple's public posturing to save current Mac users from panicking, there doesn't seem to be any plan to merge the two softwares at all. Apple plans instead to maintain three independent tracks until the equipment that is running on System 7 is old enough to be replaced with new hardware that is native to the new OS. Those tracks are to port UNIX-based Nextstep to the PowerPC before the end of the year (and possibly abandon IBM's AIX license); to maintain new System 7 releases at six-month intervals through the end of 1998; and to introduce the new OS, "Rhapsody," as soon as possible on its own native platform.

What people have to come to grips with is that the new OS will actually be a new OS. Apple needs to take the plunge quickly and get on with the new OS as soon as it can be made ready, as this is actually good for Apple, who controls only 6% of the PC marketplace with the Mac line — but could control up to 65% of the market with a new UNIX-PC-Mac-compatible operating system.

## APPLE TAKES THE PLUNGE INTO UNIX

Apple has already taken the plunge by purchasing NeXT for \$430 million. It now plans to base everything in the future on the "Mach" UNIX-kernel of Nextstep, and use UNIX's extensive cross-platform communication strengths (spiced up with a lot of Sun Java Beans, OpenDoc, Quicktime, and Cyberdog combined with new abili-

ties for preemptive multitasking, multi-threading and memory support) to create a unique platform-independent operating system. The best way to think about it is to consider how BBSes, client/servers, groupware and Internet software already provide a seamless "operating system" that is platform independent. That is what the new OS will most likely resemble when it is released before the turn of the century.

It is important to remember, too, that the use of a UNIX kernel is not new to Apple. Steve Jobs went down that road in the early development of Apple. He almost went with Microware's UNIX-based OS9, which is still heavily used by Motorola in their processors, for his Mac GUI. Had Apple done that instead of opting for a closed and protected system by developing the proprietary Mac kernel, the Mac OS would probably be more widely used today — especially in networks and Internet applications where UNIX shines and the user-friendly Mac interface would make it even better.

## APPLE'S ENTERPRISE / INTRANET FUTURE

Apple recently reduced the price on its high-end Workgroup and Internet

Servers by 27%. This makes Apple the low-cost alternative to higher-priced Wintel and UNIX servers. ISPs and network administrators can now have Mac-based or AIX-UNIX-based Internet sites up and running for under \$3,000.

This too is part of the strategy of the remake of Apple — as it intends to become a key player in the business enterprise, Internet / Intranet, multimedia markets of the future. As the brain-trust at Apple sees it, the future of PC computing will be in "networks." Not necessarily in "dumbed down terminal machines" like the \$500 desktop visions at Oracle, but more like Microsoft's vision — "a seamless desktop that extends out into cyberspace at the click of an icon." As Microsoft works to revamp all of its Windows software to ingrain net connectivity into all of its "Applications," Apple hopes to go one step further and design its new OS with built-in connectivity, so that any appli-

cation will be "net-ready" when run on top of it. This is theoretically possible with the Mach-UNIX kernel, Web-Objects, Open Transport, Cyberdog and Java. It is not possible with the current Mac architecture.

## APPLE SIGNS 'BRIDGING' AGREEMENTS WITH SUN

Apple has already started the transition to UNIX. In December it signed an extensive agreement with Sun Microsystems to bridge Sun's Solaris-based servers with Apple's desktop computers. The interoperability strengthens Apple's strategy to move computing to an "open" environment which is operating system independent.

According to Apple, both companies will work to create interoperability between Sun's Java Beans and Apple's OpenDoc technologies. Additionally, the companies plan to link Sun's JavaMedia and Apple's QuickTime multimedia standard. The agreement establishes important commitments to create deeper interoperability between Macintosh and other UNIX-based platforms, the first step in building market-share for the new OS, and in staving off an NT-dominated future.

## WHAT IT MEANS TO THE ISP

Apple has suddenly become a solid player in the small ISP community. It has the lowest cost hardware and software. Its server requires the least maintenance and administration. Its software is rich in network-capable multimedia options. It is clearly the most secure platform at this point — not as easily hacked as the Intel-compatible platforms. And, its moves to become more UNIX friendly mean even less problems upstream in any Internet connections.

And, while many will continue to wonder if Apple has a future, the business enterprise and Internet / Intranet markets usually need to update their servers in two-year purchasing cycles. This means that the low cost alternative makes even more sense.

To find out more about Apple, check out these sites:

Apple's home page on the World Wide Web is <http://www.apple.com>.

Apple's Server website is <http://www.servers.apple.com>.

The Accelerated Graphics Server website is <http://www.servers.apple.com/graphics>. ♦



# PUTTING THE NET TO WORK

by Durant Imboden

## WEIGHT LOSS FOR THE WEB-FATTENED

In the years that I've been online, my weight has expanded like the files on my hard disk.

Middle age may be taking its toll, or perhaps the electron gun of my 20-inch monitor is transferring subatomic particles from the Web to my waistline. (Would I be slimmer if I

had a smaller monitor or, better yet, a notebook's LCD display? Would liposuction extract a bucketful of compacted Web pages, e-mails, and chat logs from my gut? Or am I simply eating too many doughnuts?)

Regardless of the cause, my once-svelte tummy is beginning to assume Hitchcockian proportions. No longer can I entertain fantasies of being a gigolo on the *Cote d'Azur* or a finalist in the Slinky Latin category of the National Ballroom Dancing Championships. The best I can hope for is a trophy in the Lou Costello Lookalike Contest or the International Pavorotti Impersonators Competition.

Faced with these harsh truths, I recently went in search of a cure for my middle-aged spread. And because I had an Internet column to write, I began my quest on the World Wide Web.

My first stop was the Dieting FAQ, which I found at <http://www.cis.ohio-state.edu/hypertext/faq/usenet/dieting-faq/top.html>. The FAQ is a three-part ASCII text document that is updated once a month in the *alt.support.diet* newsgroup. It may be boring to look at, but it's a well-written article with plenty of factual information and links to related sites.

One of the FAQ's featured sites is T.O.P.S., "Take Pounds Off Sensibly," at <http://www3.ns.sympatico.ca/stoner/ tops.html>. T.O.P.S. is a "non-profit organization dedicated to helping people to help themselves in the struggle for weight loss and improved health." Members meet once a week for weigh-ins and mutual support. Membership fees vary by chapter, but are reasonable compared to the prices charged by commercial weight-loss organizations.

I was all set to join T.O.P.S. until I clicked on the "programs" link and found a description of an "I Can't Funeral" where members of a Virginia chapter symbolically buried the reasons why they couldn't lose weight. This was a little too twee for yours truly, especially since I was afraid that my pocket doughnut case might get tossed into the grave. I quickly left the T.O.P.S. site and for The Overeaters Recovery Group at <http://www.hiway.net/recovery>.

Overeaters Recovery Group is "an organization of individuals who, through shared experience, strength and hope, are recovering from compulsive eating. We use the emerging technologies of the Internet as tools to aid our recovery."

The group's tools include mailing lists, or "loops," that vary from "Rozanne" (300+ subscribers) to small loops for members with special interests such as pregnancy or diabetes. Real-time meetings take place weekly on Internet Relay Chat, using AnotherNet's servers, and on Prodigy.

Since I'm not a group person and can't walk twelve steps without tripping over my belt, I said good-bye and went back to my search engine. Entering the Boolean string "weight loss AND drugs NOT effort" led me to Focus on... Obesity (<http://pharminfo.com/pubs/msb/obesity.html>) which is reprinted from the Medical Sciences Bulletin of Pharmaceutical Information Associates, Ltd.

According to the bulletin, 33% of the population is obese. That's the bad news. The good news is that, with some 85,000,000 or more peers, fat folks in America don't have to feel alone.

After reciting a litany of reassuring and not-so-reassuring statistics, Focus on... Obesity gets down to the nitty-gritty: controlling weight with drugs. (Can you say "d-fenfluramine" without sounding like Daffy Duck?) It discusses a variety of prescription drugs and experimental substances that may be helpful in weight loss, and it even talks about a cream made with aminophylline, an asthma inhalant, that has been shown to shrink fat cells in the thighs. Unfortunately, my doctor is a Christian Scientist, so I knew I'd never be able to get a prescription for any of the drugs mentioned in the article.

Perhaps my weight problem was caused by a low metabolism, I told myself. This hypothesis led me to the Basal Metabolism page at <http://www.room42.com/nutrition/basal.shtml>, which uses a Java applet to calculate basal resting and active metabolic calorie rates. I entered my weight, height, age, sex, and activity level in U.S. pounds (kilograms are also accepted) and was told that I should be consuming 2,356 calories a day. Not wanting to miss my quota, I reached for another doughnut and headed for:

Fast Food Facts (<http://www.olen.com/food>) based on a book of the same name from the Minnesota Attorney General's Office. This site uses an e-form to display calorie counts, percentages of fat, and other

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nutritional information for menu items at the leading fast-food chains.

Entering "White Castle" and "hamburger," I learned that one of that chain's sliders weighed in at 161 calories and 8 grams of fat. A McDonald's Big Mac scored at 510 calories and 26 grams of fat-more than a doughnut, but less than a Burger King Whopper (630 calories) or two slices of Domino's pepperoni pizza (622 calories).

I mentally digested a fantasy meal of burgers, pizza, and ice cream before waddling to the American Heart Association Obesity page at <http://www.amhrt.org/heartg/obesity.html>. This page lists the risks associated with fatness (heart attacks, strokes, diabetes, gallstones, joint disease) and has links to other pages on blood pressure, cholesterol, dietary guidelines, and other topics. The AHA's Desirable Weight Table page at <http://www.amhrt.org/heartg/dweight.html> displays the classic 1959 height and weight guidelines from the Metropolitan Life Insurance Company.

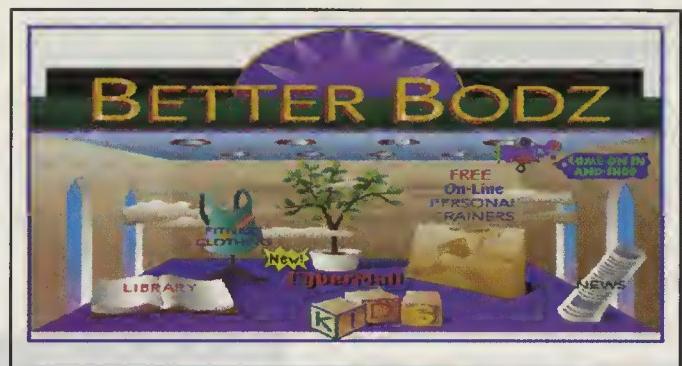
I found even more useful information on Obesity and Weight Control, a page by Michael D. Myers, MD at <http://www.weight.com/homepage.html>. The layout could use a makeover, but the content makes up for any aesthetic shortcomings. Of particular interest is a story called "Medications Under Development to Assist with Weight Management," in which Dr. Myers talks about Orlistat (a chemical that inhibits fat digestion) and Sibutramine (an antidepressant that can control appetite).

Next on my itinerary was The Diet & Weight Loss/Fitness Home Page, which HealthVision-a distributor of a food supplement called ConQuest-maintains at <http://www1.mhv.net/~donn/diet.html>. The site has a handful of useful links, including a chart of "calories burned per minute for various activities." (Sex with an active partner consumes 3.8 to 5.9 calories a minute, while heavy snow shoveling can devour up to 20.4. So, if you're fat and your partner is frigid, you might as well freeze your nuggies outdoors.)

What really makes the HealthVision page exciting is its revelation of a secret nutritional weapon used by Soviet athletes and cosmonauts over the last 50 years. This group of "performance-enhancing liquid plant extracts" can make people lose weight, reduce stress, and increase their athletic performance. Olympic athletes throughout the world are now "grasping a hold of" this new food supplement "as if it were an Olympic torch." Best of all, it's available in a money-saving "Body Contouring Pack" for only \$129, a \$63 savings off the list price.

Unfortunately, I'd spent my last \$129 on doughnuts, so I decided to stow away on a cruise ship-more accurately, a virtual voyage called Cyber Cruisin' on the U.S.S. Richard at <http://pages.prodigy.com/gazette/cruise.htm>.

The USS Richard, in case you haven't guessed, is named after Richard Simmons, author of the Farewell to Fat Cookbook and a reigning celebrity on the weight-loss circuit. Simmons organizes real-life "Cruise to Lose" voyages on Carnival Lines, where dieters lose weight as they sail the Caribbean. The Cyber Cruisin' page is a fantasy version of the same concept. Dieters weigh themselves before weighing anchor, then diet and exercise as they "visit three special ports and participate in other activities." At the end of the journey, they weigh themselves again to see how much they've lost.



The bad news-for me, anyway-was that the next cybercruise didn't leave for two months. I needed to lose weight right away so I could justify eating another doughnut. With haste in mind, I buzzed over to BetterBodz (<http://www.betterbodz.com>).

BetterBodz is in the nutritional-supplement biz. It also sells fitness clothing, but personal trainers are what distinguish BetterBodz from similar Web sites. The visitor is asked to enter height, weight, exercise goals, dietary habits, and other information in an online questionnaire. A personal trainer reviews the data, then creates a personalized training, diet, and nutritional-supplement plan for the customer. BetterBodz reports that more than half of its customers exchange e-mail with their trainers three or more times a week, a claim that demonstrates the power of "relationship marketing."

I was almost ready to sign on with a BetterBodz trainer when I realized that my wife might not approve of my exchanging three e-mails a week with a stranger (especially if that stranger was young, female, and dressed in a BetterBodz fitness leotard). Besides, the word "training" implied work, and working harder meant less time for buying doughnuts.

Still, the idea of supplements sounded good-particularly if I could combine nutritional shopping with sex and gambling at CyberMarket (<http://www.bosco.com>).



CyberMarket offers an "XXX Twilight Collection" of adult novelties, a "Lotto Logic" software package, and-more to the point-a concept named "The Ultimate Diet" that "fools the fat cells" by keeping proteins and carbohydrates apart at mealtimes. Yes, that's right! Think of it as a Kosher kitchen in your tummy, with the proteins and carbs being kept as separate as the meat and dairy products in an Orthodox rabbi's icebox.

The diet is explained in Dr. Carol Forman's \$19.95 book, Disassociated Eating.

If you're illiterate, a better buy may be CyberMarket's "Aromatrim." The \$49.95 kit features the "Crave Ender" inhaler, which suppresses your appetite by making food taste unpleasant. I was tempted until I realized that I might develop a permanent aversion to doughnuts-a thought much more frightening than the possibility of clogged arteries or a gall-stone attack.

I was distracted from my fears when my 10-year-old son asked if I'd take him to see Star Trek: First Contact for the ninth time. Answering "No," I gave him a consolation prize: a visit to The Parallels Between Star Travel and Weight Loss at <http://www.herbalive.com/startrek.html>.

The page features a starry background and opens with: "These are the voyages of the USS Energize... Boldly leading you where no one has led you before, discovering a new lifestyle, an improved self-image, and a happier and healthier you." My son snickered at the pitch for "Warp-Factor" nutritional supplements and left the room.

By now, my pants were bursting at the seams from the half-dozen crullers and sinkers I'd eaten during my tour of the

Web. I was desperate to shed a few pounds, so I hauled myself to Victoria Morton's Suddenly Slender at <http://www.suddenlyslender.com>.

Suddenly Slender is an amazing body wrap that removes inches from a plump person's body in just 60 minutes. According to Ms. Morton's scientific description, the human body stores up "metabolic wastes and environmental poisons" as it ages. Her Suddenly Slender body wrap sucks out those layers of toxic substances, leaving a slimmer and more youthful-looking body.

## *The Parallels Between Star Travel and Weight Loss*

The results are stunning: a minimum six-inch loss (four inches for men) on the client's first visit, with an average of more than 13 inches removed from "problem spots." According to Suddenly Slender's Web page, "the Victoria Morton process has been used in over 2,000,000 wraps and has taken more than 600 miles (in inches) off our Patrons."

I was ready to order a body wrap when I discovered that it isn't a do-it-yourself process, but requires a visit to a Suddenly Slender treatment center. Anyway, I wanted to lose more than 13 inches of flab-and certainly more than the four-minimum quoted for men. Biting the bullet (having run out of doughnuts), I opened my browser to The Center for Surgical Treatment of Obesity in Los Angeles (<http://www.cstobesity.com>).

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CSTO's home page features a picture of a sultry, statuesque woman who bears no resemblance to the lardy lady in a black-and-white "before" photo. The formerly fat model, Cordetta Spells of San Francisco, now wears the Fobi Pouch—although you'd never know it from the photo, which emphasizes her figure rather than the "vertically banded gastric bypass which reduces the stomach size from its original 3000 cc capacity to 30 cc."

The Fobi Pouch is a kinder and gentler version of "stomach stapling," a form of bariatric surgery that was in vogue during the 1960s. Some 6,000 patients have had their stomachs made smaller by Dr. Mathias Fobi and his staff since 1981.

I might have been tempted by the surgery, but I was concerned about how little room I'd have for doughnuts in a 30-cc stomach. And what would happen if entire doughnuts simply avoided my stomach, heading for my intestines and points south?

Now the time had come for me to accept my condition for what it was: a gift from God, who'd created me in His image—or, if not in His image, then in the image of an overweight relative.

To accept myself, I needed the support of others, and that's exactly what I found at the Big Folks Health FAQ at <http://www.cis.ohio-state.edu/hypertext/faq/use/net/fat-acceptance-faq/health/faq.html>.

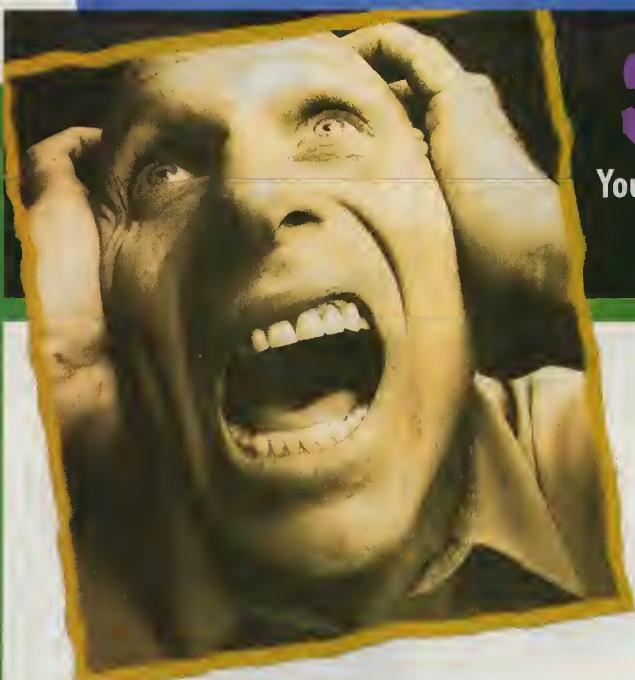
The Big Folks Health FAQ takes a realistic view of adipose excess. It reassures its heavyweight audience with state-

ments like: "Obesity does not exacerbate high blood pressure. (If you were going to have high blood pressure anyway, being fat isn't making it worse). And, in fact, a fat person with high blood pressure is less likely to get a stroke or heart attack than a thin person with high blood pressure." The FAQ includes links to other medical sites that take an evenhanded approach to obesity.

Feeling a little better about myself, I guided Internet Explorer to another site with a favorable attitude toward flab: the National Association to Advance Fat Acceptance, whose pages at <http://naafa.org> are titled NAAFA Online.

NAAFA bills itself as "a non-profit human rights organization dedicated to improving the quality of life for fat people." Its site includes policy statements, information brochures (such as "Airline Tips for Large Passengers"), links to newsgroups such as news:alt.support.big-folks, FAQs, mailing lists, and Radiance, The Magazine for Large Women, at <http://www.radiancemagazine.com>.

With the Big Folks Health FAQ, NAAFA, and an inspirational Rosie O'Donnell interview in Radiance to make me feel better about my bulk, I knew there was only one thing to do: Be myself. Reaching for my Boardwatch coffee mug, I poured myself a cup of Java (the drink, not the language) and settled down to the Mmmm... Donuts page at <http://don.skidmore.edu/~brunning/dnd/>. The photos of Dunkin' Donuts were almost as tasty as the real thing—and a lot less fattening, even if I no longer cared. ♦



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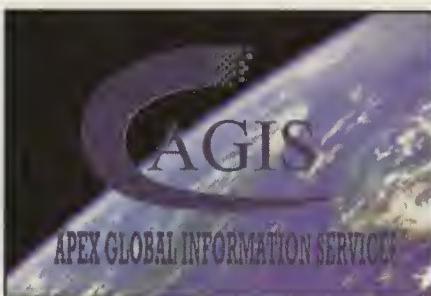
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# DVORAK ONLINE

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## THE END OF SALES AS WE KNOW IT

by John C. Dvorak

I've been experimenting on the WWW with various sites and theories. The most fascinating to me is the idea of a web vending machine.

That's a site that sells some product on its own without the site owner having to spend much time either maintaining the site or dealing with customers except on occasion. In the process it became apparent that the Web vending machine will exacerbate the already eroding 19th century distribution system that began a decline with the advent of Federal Express. While Federal Express made direct marketing even more direct, the web makes direct sales more direct.

My site is [www.easydiet.com](http://www.easydiet.com) or just [easydiet.com](http://easydiet.com). On it I sell Chitosan, a weight loss pill that is non-systemic and simply binds with oils and prevents their digestion.

You can go to the site for the sales pitch. It's quite interesting. I was turned on to these capsules by another guy selling them and signed on after

having both lost weight and become fond of the Web vending machine concept. The company who makes this particular brand of pill is IDN, a subsidiary of Nuskin International one of the most aggressive multi-level or network marketing companies. All these companies are clones of Amway and few are outside of Utah. They are always being investigated for over-emphasizing downlinks and getting people to join their sales force and being less interested in actually selling products. Anyone who has had the unfortunate experience of visiting an Amway presentation soon sees that the people giving the presentation sell the get-rich-quick aspect of the company rather than soap. This is unfortunate since there are some good products to buy — such as Chitosan.

As I set up my Web vending machine and began to actually sell these fantastic pills using my own weight loss as a model, I soon got a form letter from Nuskin telling me that I was forbidden from using the Internet to "advertise." Since there were dozens of others selling the same stuff on other sites long before I began (and still do) I had to assume this letter came as the result of a complaint or who knows. It was obvious that Nuskin had no clue as to the extent in which its distributors use the net since nobody at the company can apparently use Altavista or Lycos or any-

thing. Otherwise they'd be combing the web for violators. It's apparent that the control freaks who run many of the MLM marketing companies have no clue as to what's about to happen to them. One irony is that many of them expect to be selling low-cost phone service and then Internet access. Once their own customers get Internet access they'll discover two things: A) Price competition and B) the truth. One thing that disturbed me the most about almost all the sellers of Chitosan is the repeated claim that the Chitosan weight-loss pill was somehow patented and only available from [put a company name here]. A scan of the web turned up a slew of companies selling the same stuff as well as bulk wholesale shiploads of the stuff available from Japan where the powder is a rage. When more carefully examined the claim is for a process that makes the Chitosan work better. But the hints of total exclusivity are all over the place.

On my site I simply switched to another vendor. It wasn't hard to do. And the vending machine concept stays alive. I assume Nuskin doesn't care. But they will once they discover that controlling the channels of distribution are over forever thanks to the web. All these companies that think they can control territories as if it were 1920 and the door-to-door salesman could actually make a living are fooling themselves. The MLM folks while still increasing sales may be the last to discover reality. The Amway folks for example rely on the lower-middle class — few connected to the Internet — to make the MLM network happen. These same people, who tend to be fanatics in a number of different ways, will soon discover the net and all hell will break loose. The net is crawling with MLM schemes and they blossom faster than imaginable. The control freaks who run Amway and Nuskin won't know what hit them.

The entire infrastructure of sales and distribution has been breaking down for years as direct marketing has matured. With modern transportation schemes a Gateway2000 computer easily competes with any local computer store. Because of the size of the centralized computer makers they can get components at

In addition to his weekly syndicated radio call-in show, "Software/Hardtalk," syndicated newspaper columns, magazine writing for *MacUser*, *PC Computing*, *DEC Professional*, *Information Technology*, and his featured "Inside Track" column in *PC Magazine*, Dvorak is the author of several best-selling books, including *Dvorak's Inside Track to DOS & PC Performance*, *Dvorak's Guide to PC Telecommunications*, and *Dvorak's Inside Track to the Mac*. John can be reached at <mailto:dvorak@aol.com>.

lower prices and can actually undercut the retailer by a large margin. This is especially true if a middleman is involved. While this trend began with the advent of Fedex and the expansion of UPS it is shoved into high gear with the Internet. Jack Rickard, the editor of this magazine, has been on the conceptual cusp of these societal changes better than anyone I know and we recently chatted about this phenomenon. His simple prediction that 1997 will be THE year that people really start using the net for purchasing goods is right on the money and not everyone sees it coming. Right now the litany has it that few people will spend over \$100 on a net pur-

chase. And there is still some reluctance to use a credit card due to security concerns. The media has been pounding on the public ridiculing this fear over the last few years. "You're only liable for \$50 — so why worry?" is one chant. The other is, "You give people a credit card number over the phone. What's the difference?" This will be combined with an increased selection of products. Amazon Books ([www.amazon.com](http://www.amazon.com)) is a perfect example of the direction things will go. With a bigger selection of books than any normal store could possibly have, why go to a bookstore? Obscure titles are never at the bookstore anyway. But the bookstore is a good place to browse

and socialize. So when your mind is made up, you go online to buy. For a shopping experience you'd go to a store. Thus a real-time real-world store will only succeed if it provides an experience. This is going to change a lot of notions about retailing.

The net should also excel with boutique one-of-a-kind merchandise that needs a large market to succeed. And the vending machine notion such as [EasyDiet.com](http://EasyDiet.com) specializing in focused markets should do as well as a vending machine. This year will be fun to watch as it begins to be the tail that wags the dog. ♦

## Dvorak's Recipe Nook

### CHEAPER SALAD DRESSINGS

If you've ever used the Good Seasons dressing mixes you know that preparing a dressing with quality vinegar and oil makes a huge difference in the taste. The Good Seasons packs are excellent blends too, but at \$1.25 each for a packet of seasoning, surely we can do better. I'd like to hear from readers for alternative spice mixtures that use the Good Seasons bottle. Here's one I recently developed for the family.

#### BALSAMIC DRESSING

Fill a Good Seasons bottle to the vinegar line with some good balsamic vinegar. Then add water to the water line. Note that you should only do this with a vinegar that is 7-percent acid, anything lower is already too dilute. For such a vinegar, fill to the top of the water line. Add the following ingredients and shake well.

- 1 level TBL celery salt
- 1 TBL ground black pepper
- 1 TBL dried tarragon
- 1 TBL dehydrated minced onion
- 1 TSP dehydrated granulated garlic

Let stand 10 minutes then fill to oil line with olive oil, shake and pour.

Excellent on tomatoes and other salads. Also makes a nice marinade.



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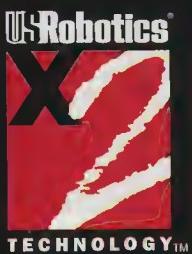
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Those interested in exhibiting at the ISPCON, should contact Bob Holley at (voice) 800-933-6038, 303-933-6038 or e-mail to [bob.holley@boardwatch.com](mailto:bob.holley@boardwatch.com)

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